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Benares Hindu University.



Prospectus of Studies

FOR

The Admission Examination of 1927

(Including (1) Regulations for the Admission of Students
(2) Special Regulations regarding the Admission
of Women Students and (3) General Rules
for Examinations).

BENARES HINDU UNIVERSITY.

EXTRACTS FROM CHAPTER XL OF THE REGULATIONS.

* * * *

(1) Conditions to be fulfilled by candidates for the Admission Examination in Arts and Science

Chapter
XIV

3. A candidate for the Admission Examination in Arts and Science shall be either a pupil of a recognised school, or a private candidate.

Chapter
XVII.

4. When a school is situated in British India, the conditions regarding its recognition for the purpose of sending up candidates for the Admission Examination of the University shall be as follows—

- (a) The school shall apply to such officer and in such form, and shall specify such particulars as shall be prescribed by the Local Government of the Province or place in which it is situated and the Local Government if it thinks fit, and after such inquiry as it may deem necessary, may recognise the school for the purpose of sending up candidates.
- (b) If the application is granted, the school shall be entered on the list of schools so recognised, and a copy of the entry shall be sent to the Registrar of the University.
- (c) No school so recognised shall during the period that it remains so recognised, prepare or send up candidates for the Matriculation or Admission Examination of any other University, provided that, with the special consent of the Syndicate, it may prepare and send up candidates for the *Praveshika Pariksha*.
- (d) The Local Government may at any time remove any school from the list of recognised schools.

- (e) A copy of the order removing a school from the list of recognised schools shall forthwith be sent to the Registrar of the University.

**Chapter
XVII.**

5. When a school is situated in the territory of an Indian Prince or Chief, the procedure governing its recognition for the purpose of sending up candidates for the Admission Examination of the University shall be as follows:—

- (a) The Government of India may direct in respect of any State that recognition of a school by the Government of that State shall (subject in any case, to revision by the Government of India) be recognition for the purpose of sending up candidates.
- (b) If a school situated in a State, regarding which the Government of India have made no such direction, desires recognition, the Government of India may, if it thinks fit, and after such enquiry as it may deem necessary, empower the Government of that State to recognise that school for the purpose of sending up candidates.
- (c) In either case, the conditions (a), (b), (c), (d), and (e) of Regulation 1 of Chapter XI, shall be fulfilled, save that (subject to revision by the Government of India of the granting and retention of recognition) the Government of the State concerned shall be substituted for the Local Government.

**Chapter
XVII.**

6. The Syndicate shall have power, from time to time, to prescribe further conditions for recognition to be complied with by schools which fulfil the conditions required under the two preceding Regulations.

**Chapter
XIV.**

7. A candidate shall be deemed to be a pupil of a recognised school when he has studied in it or in more than one recognised school for at least two years previous to his admission to the University, or, if local rules regarding study, examination, etc., demand, for a longer period. Such a candidate shall apply, through the Headmaster of the school where he is studying, to the Registrar, in such form as the Syndicate may prescribe. His application and fee shall be despatched, so as to reach the Registrar at least six weeks before the date of the commencement of the Admission Examination. * * *

8. *A private candidate is one who has not studied in any school or other educational institution for at least one year immediately previous to his admission to a University examination. Chapter XIV.

9. When a private candidate is a resident of British India, he shall be certified by an Inspector of Schools appointed by the Local Government of the Province or place where he resides, or by some other officer empowered by the Local Government for this purpose, to be a fit person to appear at the Admission Examination. The Syndicate shall, ordinarily, require that, in cases where a candidate has at any time previously studied in a school or an institution, a satisfactory certificate from the head of that school or institution shall be forwarded by the certifying officer. Chapter XIV.

10. When a private candidate is a resident of the territory of an Indian Prince or Chief, he must (a) if the Government of India have made the direction specified in Regulation 5 (a) of Chapter XL regarding that State be certified by the educational authority of that State to be a fit person to appear at the Admission Examination, or (b) if no such direction has been made regarding that State, be similarly certified by an officer empowered by the Government of India to be so qualified, in either case if the candidate has at any time previously studied in a school or an institution, the certificate prescribed under the last sentence of Regulation 9 of Chapter XL shall ordinarily be required. Chapter XIV.

11. A private candidate shall apply to the Registrar, in such form as the Syndicate may prescribe. His application and fee shall be despatched through the prescribed channel, so as to reach the Registrar at least six months before the commencement of the Admission Examination. Chapter XIV.

12. Whether a candidate is a pupil of a recognised school or a private candidate he shall satisfy the Syndicate as to his fitness for admission to the courses of the University by passing the Admission Examination, which shall be held at Benares at times prescribed from time to time by the Syndicate. Chapter XIV.

*Permission will not be granted to appear privately at the next ensuing Admission Examination to candidates who have failed to obtain promotion into Class X or the equivalent class in any school.

REGULATIONS—CHAPTER XV.

Admission of Women Students and Special Regulations governing their residence, examination, etc.

1. Women candidates shall be eligible for admission to the University and to its examinations, degrees and diplomas.

* * * * *

3. With the permission of the Syndicate, women candidates shall be eligible to appear at all examinations of the University (whether for admission or for a degree or a diploma) as private candidates.

4. It shall be open to the Syndicate to make arrangements for the examination of women candidates in *pardah*.

5. Women candidates shall not be compelled to appear in person before the President of the Convocation for their diplomas.

6. The Syndicate shall, from time to time, make such arrangements for the residence of women students as may be necessary.

7. In other respects, the conditions governing women candidates and students shall be those prescribed in these Regulations for male candidates.

EXTRACTS FROM REGULATIONS CHAPTER XXVI.

Examinations.

General Rules

+ * + *

2. All applications to appear in an examination shall be addressed to the Registrar, and shall be presented within such time and in such manner as may be prescribed by the Syndicate. Every such application shall be accompanied by a satisfactory character certificate from the head of the College or school to which the applicant belongs.

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4 Except as provided in Regulation 3, a candidate, when admitted to one or more subsequent examinations or any part thereof, shall, before admission, pay the prescribed fee for such examination on each occasion when he is so admitted.

5 On receipt of the fee prescribed for the examination, the Registrar shall examine the application, which, if found to be in due form and in order, shall be registered in the register of candidates for such examination. The Registrar shall thereupon issue an admission card to the candidate entitling him to sit for the said examination.

6. A candidate may not be admitted into the examination room, unless he produces to the officer conducting the examination, his admission card or satisfies such officer that it will be subsequently produced.

7 A student shall be deemed to have pursued a regular course of study in a subject during a year or years, if he has attended at least seventy-five per cent of the course of lectures delivered in that subject during the year or years and has produced a satisfactory character certificate from the Head of his College or School.

8. The Syndicate shall have power to condone any deficiency of attendance, but only for cogent reasons

+ * + *

11. The term "year" in these Regulations means the term or terms of study or periods of study in the University or in one of its constituent Colleges, prescribed by the University, during a year of the Gregorian Calendar.

REGULATIONS—CHAPTER XXVII.

Admission Examination in Arts and Science.

1. There shall be an Admission Examination held every year at Benares, at such times and on such dates as the Syndicate may prescribe, for admission to the studies of the Faculties of Arts and Science.

2. The candidates admitted to this examination shall fulfil the conditions prescribed in Regulations 3 to 12 of Chapter XL (Regulations 4 to 10 of Chapter XIV, *read* with the Regulations of Chapter XVII).

3. The Registrar shall take the orders of the Syndicate on each application for admission to this examination.

4. The Admission Examination shall be conducted by means of papers. There shall also be a practical examination in Science subjects.

5. Candidates for the Admission Examination in Arts and Science shall be examined in the following subjects :—*

- A. (1) English
- (2) Mathematics.
- (3) History and Geography.
- (4) Samskrit and
- (5) any *one* or *two* of the following subjects :
 - (a) A Modern Indian Language.
 - (b) Any other Classical Language.
 - (c) A Modern European Language.
 - (d) Elementary Physics and Chemistry
 - (e) Botany.
 - (f) Drawing
 - (g) Manual Training.
 - (h) Agriculture and Surveying.
 - (i) Commerce.
- B. (1) English.
- (2) Mathematics.

* (1) Private candidates shall not be allowed to take Science or Manual Training as one of the subjects for examination unless they satisfy the Syndicate that they have completed a course of instruction in Science or Manual Training as the case may be.

- (3) History and Geography.
- (4) A Modern Indian Language
- (5) Any *one* or *two* of the following subjects :—

- (a) Samskrit.
- (b) Any other Classical Language.
- (c) A Modern European Language.
- (d) Elementary Physics and Chemistry.
- (e) Botany.
- (f) Drawing.
- (g) Manual Training
- (h) Agriculture and Surveying.
- (i) Commerce.

C. In the case of women candidates the following combinations of subjects shall also be allowed :—

- (1) English.
- (2) History and Geography
- (3) A Modern Indian Language and any *two* or *three* of the following subjects :—

- (a) Samskrit.
- (b) Mathematics
- (c) Any other Classical Language.
- (d) A Modern European Language.
- (e) Elementary Physics and Chemistry.
- (f) Botany.
- (g) Drawing
- (h) Music.
- (i) Manual Training.
- (j) Agriculture and Surveying.
- (k) Commerce
- (l) Domestic Science (with special reference to Indian conditions).

6. A candidate for admission may present himself for one or more subsequent examinations, provided that he shall on every such occasion satisfy the Registrar that he has fulfilled the conditions laid down in these Regulations as if he were a candidate appearing for the first time.

7. A certificate signed by the Registrar shall be given to each successful candidate, setting forth the date of the examination, the optional subjects in which he was examined and the Class in which he was placed.

SYLLABUS AND TEXT BOOKS.

English.

There will be two papers each of three hours' duration and each carrying 100 marks; the *first* will be on the text-books of poetry and prose prescribed by the University with questions on English usage and idiom bearing on them while the *second* will consist of easy exercises in paraphrase and composition and of exercises in composition based on the subject matter of books prescribed for general or "non-detailed" study.

N.B.—Alternative questions will be set, at least to the extent of half the number of questions in each paper

Books prescribed :

1. *Poetry.*

Thomson's Anthology of Verse for Indian Schools
Abridged edition for Schools—(Macmillan).

2. *Prose.*

KINGSLEY: *Heroes* (Blackie and Son's edition).

SWIFT: *Gulliver's Travels*, abridged and edited by
G. C. Earle (Macmillan's English Literature for Schools).

3. *Non-detailed study*

ANNIE BESANT: *Children of the Motherland* (To be had
from Messrs. Nand Kishore & Brothers, Chowk, Benares).

The *Three Musketeers*—abridged and edited for schools
by Messrs. C. H. Brown and H. S. Walker (Macmillan's
English Literature Series).

Mathematics.

There will be *two* papers in Mathematics, *one* paper in Arithmetic and Algebra, and a *second* paper in Geometry, each of three hours' duration and each carrying 100 marks.

The courses shall be as follows:—

(1) *Arithmetic*.—The whole of Arithmetic. (The use of

Algebraical symbols and processes will be permitted).

- (2) *Algebra*.—The four simple rules. Fractions. Greatest Common Measure. Least Common Multiple. Factors. Remainder Theorem. Proportion. Easy Surds. Theory of Indices. Simple Equations of one or more unknown quantities with easy problems. Easy Quadratic Equations. Elementary Graphs.

(Candidates will be provided with squared paper).

- (3) *Geometry*: Practical and Theoretical Geometry. --

The questions on Practical Geometry will be set on the constructions contained in the annexed Schedule A together with easy extensions of them. All figures should be drawn accurately, for which purpose every candidate should provide himself with a graduated scale, a pair of set-squares, a protractor, a compass and a hard pencil.

The questions on Theoretical Geometry will consist of theorems contained in the annexed Schedule B together with easy extensions and deductions, with numerical illustrations. Any proof of a proposition will be accepted which appears to the Examiners to form part of a systematic treatment of the subject, the order in which the theorems are stated in Schedule B is not imposed as the sequence of their treatment. In the proof of the theorems hypothetical constructions will be permitted.

(Candidates will be provided with squared paper.)

SCHEDULE A.

Bisection of angles and of straight lines.

Construction of perpendiculars to straight lines.

Construction of an angle equal to a given angle.

Construction of parallels to a given straight line.

Simple cases of construction from sufficient data of triangles and quadrilaterals.

Division of straight lines into a given number of equal parts or into parts in any given proportions.

Construction of a triangle equal in area to a given polygon.

Construction of tangents to a circle and of common tangents to two circles.

Simple cases of the construction of circles from sufficient data.

Construction of a fourth proportional to three given straight lines and a mean proportional to two given straight lines.

Construction of regular figures of 3, 4, 6, or 8 sides in or about a given circle.

Construction of a square equal in area to a given polygon.

SCHEDULE B.

ANGLES AT A POINT.

If a straight line stands on another straight line the sum of the two angles so formed is equal to two right angles; and the converse.

If two straight lines intersect, the vertically opposite angles are equal

PARALLEL STRAIGHT LINES.

When a straight line cuts two other straight lines, if

- (i) a pair of alternate angles are equal, or
- (ii) a pair of corresponding angles are equal, or
- (iii) a pair of interior angles on the same side of the cutting line are together equal to two right angles, then the two straight lines are parallel; and the converse.

Straight lines which are parallel to the same straight line are parallel to one another.

TRIANGLES AND RECTILINEAL FIGURES

The sum of the angles of a triangle is equal to two right angles.

If the sides of a convex polygon are produced in order, the sum of the angles so formed is equal to four right angles.

If two triangles have two sides of the one equal to two sides of the other, each to each, and also the angles

contained by these sides equal, the triangles are congruent.

If two triangles have two angles of the one equal to two angles of the other, each to each, and also one side of the one equal to the corresponding side of the other, the triangles are congruent.

If two sides of a triangle are equal, the angles opposite to these sides are equal; and the converse

If two triangles have the three sides of the one equal to the three sides of the other, each to each, the triangles are congruent.

If two right-angled triangles have their hypotenuses equal, and one side of the one equal to one side of the other, the triangles are congruent.

If two sides of a triangle are unequal, the greater side has the greater angle opposite to it; and the converse.

Of all the straight lines that can be drawn to a given straight line from a given point outside it, the perpendicular is the shortest.

The opposite sides and angles of a parallelogram are equal, each diagonal bisects the parallelogram and the diagonals bisect one another.

If there are three or more parallel straight lines and the intercepts made by them on any straight line that cuts them are equal, then the corresponding intercepts on any other straight line that cuts them are also equal.

AREAS.

Parallelograms on the same or equal bases and of the same altitude are equal in area.

Triangles on the same or equal bases and of the same altitude are equal in area.

Equal triangles on the same or equal bases are of the same altitude.

Illustrations and explanations of the geometrical theorems corresponding to the following algebraical identities:—

$$\begin{aligned}
 k(a+b+c \dots\dots\dots) &= ka+kb+kc+. \dots\dots \\
 (a+b)^2 &= a^2+2ab+b^2 \\
 (a-b)^2 &= a^2-2ab+b^2 \\
 a^2-b^2 &= (a+b)(a-b)
 \end{aligned}$$

The square on a side of a triangle is greater than, equal to, or less than, the sum of the squares on the other two sides according as the angle contained by those sides is obtuse, right or acute. The difference in the case of inequality is twice the rectangle contained by one of the two sides and the projection on it of the other.

LOCUS.

The locus of a point which is equidistant from two fixed points is the perpendicular bisector of the straight line joining the two fixed points.

The locus of a point which is equidistant from two intersecting straight lines consists of the pair of straight lines which bisect the angles between the two given lines.

THE CIRCLE.

A straight line drawn from the centre of a circle to bisect a chord which is not the diameter, is at right angles to the chord; conversely, the perpendicular to a chord from the centre bisects the chord.

There is one circle and one only which passes through three given points not in a straight line.

In equal circles (or in the same circle), (i) if two arcs subtend equal angles at the centres, they are equal (ii) conversely, if two arcs are equal, they subtend equal angles at the centre.

In equal circles (or in the same circle), (i) if two chords are equal they cut off equal arcs (ii) conversely, if two arcs are equal the chords of the arcs are equal.

Equal chords in a circle are equidistant from the centre and the converse.

The tangent at any point of a circle and the radius through the point are perpendicular to one another.

If two circles touch, the point of contact lies on the straight line through the centres.

The angle which an arc of a circle subtends at the centre is double that which it subtends at any point on the remaining part of the circumference.

Angles in the same segment of a circle are equal and if the line joining two points subtends equal angles at two

other points on the same side of it, the four points lie on a circle.

The angle in a semi-circle is a right angle, the angle in a segment greater than a semi-circle is less than a right angle and the angle in a segment less than a semi-circle is greater than a right angle.

The opposite angles of any quadrilateral inscribed in a circle are supplementary; and the converse.

If a straight line touch a circle and from the point of contact a chord be drawn, the angles which this chord makes with the tangent are equal to the angles in the alternate segments.

If two chords of a circle intersect either inside or outside the circle, the rectangle contained by the parts of the one is equal to the rectangle contained by the parts of the other.

PROPORTION ; SIMILAR TRIANGLES.

If a straight line is drawn parallel to one side of a triangle, the other two sides are divided proportionally; and the converse

If two triangles are equiangular, their corresponding sides are proportional; and the converse.

If two triangles have one angle of the one equal to one angle of the other and the sides about these equal angles proportional, the triangles are similar.

The internal bisector of an angle of a triangle divides the opposite side internally, in the ratio of the sides containing the angle and likewise the external bisector externally.

The ratio of the areas of similar triangles is equal to the ratio of the squares on corresponding sides.

The following books are suggested :—

1. HALL, STEVENS AND SIMS: A School Arithmetic for Indian Schools.

2. DEXTER AND GARLICK: Senior Arithmetic (Longmans Indian edition) adopted for use in India by C. Pollard.

3. BAKER AND BOURNE: Elementary Algebra Part I.

4. K. P. BASU'S Algebra Part I.

5. HALL AND STEVENS: A School Geometry Parts I-V.

History and Geography.

There will be two papers each of three hours' duration and each carrying 100 marks.

Paper I.

(a) Outlines of the History of England:—

Book recommended:—

J. S. Lay: The English People (Macmillan & Co.)

(b) History of India:—

Books recommended:—

VINCENT A. SMITH: Oxford Students' History of India.

or

M. N. Roy—History of India (in Hindi).

Paper II—General and Physical Geography.—

A.—The Elements of Astronomical, Mathematical and Physical Geography.

The Solar System Eclipses Rotation and Revolution the Earth and their effects Climatic zones Latitude and Longitude. Time. Principles of Map drawing. Shape of the Earth. Geological structure of the Earth. Rocks and Volcanoes. Ocean movements. The effects of Climate. Rivers and their work. Soil and its characteristics

Atmosphere, Air, Wind, Storm, Cyclones and Water-Spouts. Formation of Deserts and Mountains and their influences on the surrounding countries

B.—General Geography of the World in outline, with India in fuller detail with special reference to the following:—

Relief. Climate and Rainfall; Soil and Products, Industries and Commerce; Communication and Population.

Text-book:—

LONGMANS' Geographical Series for India, Book II.

or

The World and India (Oxford Geographies) adapted by P. C. Wren.

HERBERTSON'S Junior Oxford Geography, may also be consulted

Sanskrit.

There will be two papers in Sanskrit, each of three hours' duration and each carrying 100 marks. *One* will be on the prescribed text-book and the other on the book recommended for rapid reading with questions on grammar and short sentences in English for translation into Sanskrit.

Paper I.

Text-Book :—

Sanskrita Manjari by Prof. N. K. Bhattacharya. (To be had from Messrs Nand Kishore and Brothers, (Chowk, Benares.)

Paper II

- (a) Book recommended for rapid reading.
Kusumamala Part I (First Series.)
- (b) Grammar—
Bhandarkar's Books I and II are recommended.
- (c) Translation. Apte's Progressive Exercises Part I is recommended.

N B,—*Sanskrit shall be written in the Devanagari script*

Arabic and Persian.

There will be two papers, each of three hours' duration and each carrying 100 marks. *One* will be on the text-books prescribed with questions on grammar and idiom. The *second* will consist of passages of unseen prose for translation into English or Urdu or Hindi as well as a number of short sentences for translation from English or Urdu or Hindi into the Classical Language.

(a) ARABIC.

Majma-ul- Adab by Louis Cheikho, Vol. I, Pages 7-23 and 41-152, (Published by the Imprimerie Catholique, Beyrout, Syria, and sold by the Book Depot at Aligarh).

For supplementary reading —

Majma-ul- Adab, Vol. I—pages 234-276.

(b) PERSIAN.

Prose :—

Gulistan of Sadi, Chapters I, II and III (omitting the Preface).

Poetry :—

Bostan of Sa'di Book I (including the Preface).

For rapid reading :—

Qand-i-Parsi published by the Azad Book Depot, Lahore.

Modern Indian Languages.

There will be *two* papers, each of three hours' duration and each carrying 100 marks.

The *first* paper will be set from the prescribed books of poetry and prose with questions on grammar and idiom.

The *second* paper will be on composition, consisting of (1) an essay based on the subject matter of the books prescribed and (2) a general essay or letter or both. No question on translation or on grammar shall be set in this paper.

N. B. Alternative subjects will be set for the essay at least to the extent of half the number.

Text-Books.

(a) HINDI.

(1) *Satya Harischandra* by Bharatendu Harischandra (Nagari Pracharini Sabha).

(2) *Sankshipta Sachitra Ramayana* (Indian Press Edition) by Shyam Sundar Das.

Jataka Katha Mala by Ramachandra Varma.

Sankshipta Hindi Vyakarana by Kamta Prasad Guru.

(b) URDU.

(1) *Guldasta-i-Adab* (The Indian Press, Allahabad).

(2) *Nadir-ul-Qawaid* by Lala Harnam Das (The Indian Press, Allahabad).

(c) BENGALI.

(1) *Aryakirti* by Rajani Kanta Gupta.

(2) *Katha-o-Kahini* by Rabindranath Tagore.

(3) The following selected poems from *Kuhu-o-Keku*.

1. Dhuli
2. Mati

3. Gangarprati
4. Baranasi

- | | |
|-----------------|-------------------|
| 5. Chhinnomukul | 8. Rishi Tolstoi |
| 6. Himalayastak | 9. Kavi-Prashasti |
| 7. Sagar Tarpan | 10. Amara. |

(4) *Bhasha-Bodha* by Nakuleshwar Bhattacharya.

(5) *At-ti-Galpa* by Rabindranath Tagore.

(d) ASSAMESE.

Paper I (Texts in prose and poetry).

(1) *Sarathi* by Satyanath Bora.

(2) *Sadhu Kathar Kuki* by Lakshmi Nath Bezbor.

(3) Poetical pieces in the *Sahitya-Samgraha* by Padmanath Barua.

(4) *Anjali* by Durgeshwar Sarma.

Grammar: *Vyakarana* by Hemchandra Barua.

Paper II—Composition.

(e) MARATHI.

(1) लेखे—गद्यरत्न समुच्चय

(2) The following selections from नवनीत published by the Education Department, Bombay, fifth edition:—

वामन पंडित—स्फुट श्लोक [१३३-१४३ पृष्ठ]

मुत्तेश्वर—हरिश्चन्द्र आख्यान [१८२-२१० पृष्ठ]

मोरोपंत—कथपर्वतीज कृष्णार्जुन युद्ध, आर्या १११ पासून २१२ पर्यंत)

तुकाराम—अभंग—२, ३, १८, १९, २०, २१, २७, २९, ४२, ४३, ४४, ४६, ४८,

६२, ७१, ७३, ७४, ८०, ८६, ९०, ९३, ९४, १०१, १११,

१३३, १३८, १४२, १४४, १६७, १७३, १७४, १७६

जोशी—मौढबोध व्याकरण ।

(f) GUJRATI.

(1) *Karana Ghelo*, by Nandshanker (School Edition).

(2) *Mamerun*, by Kavi Premananda.

(3) *Forbes Viraha* by Kavi Dalpatram.

(4) *Kusumamala*.

(g) SINDHI.

Prose:—

Guldesto by Messrs Dayaram Vasanmal and Lilaram Premchand (the whole book).

Poetry :—

(1) *Shah Jo Rasalo*: Sur Sarang (Pages 66 to 91)—the Education Department Edition.

(2) *Jawhar-e-Nazim* by Mr. Bherumal Maharchand.

(h) PARBATIA.

(1) *Bhanubhaktia Ramayana* (Poetry) Balakanda, Ayodhya Kanda, Aranya Kanda and Kiskindha Kanda.

(2) *Sankshipta Bharata* (Prose): Adi, Vana, Virat and Udyoga Parvas.

(3) *Gurkha Vyakaranabodha*.

(i) TAMIL.

Paper I (Texts) :—

(1) Readings in Tamil, Prose and Poetry Second Series by S. Anavarata Vinayagam Pillai (C. Coomaraswami Naidu and Sons) and

(2) Selections from Tamil Literature Part II compiled by Dewan Bahadur S. Bananandam Pillai (Macmillan & Co.).

(All the Prose selections and Poetry selections from Nalavenba : Thayumanavar and Kuchelo-upakhyanam).

Paper II Composition.

(Non-detailed study).

(1) *Vivekachandrika*, by T. A. Swaminatha Iyer.

(2) *Bhakti-Vachanam* by Srimati Lalita Devi (Oxford University Press).

(j) TELUGU.

Paper I.

Poetry. *Bhagavatamu*: Gajendramokshamu (with notes (V. Ramaswami Sastrulu and Sons).

Prose. The Great Indian Emperors: K. V. Lakshmana Row, M.A. (Telugu Encyclopaedia Office, Madras).

Paper II Composition.

(Non-detailed study):

Prachanna Pandavamu by Ch. Lakshmi Narasimham, Rajahmundri.

Nitichandrika by Chinniah Suri (Sections Sandhi and Vighraha only)

(k) CANARESE.

Paper I.

Poetry. *Padyasara*. Part I, Stanzas 1-105 (Education Dept., Mysore).

Prose: Ramkrishna Paramahansa by T. S. Venkanayya and A. R. Krishna Sastri.

(Non-detailed study.)

Kelarusanna Kathegake by M. Venkatesa Iyengar.

Karnataka Simhasana Samsthane by Deshpande.

(l) MALAYALAM.

Paper I

Poetry : Disciple and the Son by Vallathol Published by Vallathol Kala Sthapanam Vadakencheri, Cochin.

Paper II

Prose—Marthanda Varma, by C. V. Raman Pillai, B.A.
(B. V. Book Depot, Trivandrum)

Non-detailed study: *Bhutarayana* by H. H. Appan Thambiran (Saraswati Vilasam Book Depot, Trichur) *Gadyamalika*, Vol. I. (B. V. Book Depot, Trivandrum.)

Modern European Languages.

There will be *two* papers, each of three hours' duration, and a *viva voce* examination. Each paper will carry 90 marks and there will be 20 marks for the *viva voce*.

Paper I will consist of easy passages in prose for translation from the Modern European Language into English partly from the prescribed books and partly unseen.

Paper II will consist of passages of easy English prose to be translated into the Modern European Language with easy questions on grammar.

For the *viva voce*, importance will be attached to pronunciation.

(a) FRENCH.

DUMAS : L'Évasion du Duc de Beaufort.

Le Français et sa Patrie (Selections).

(b) GERMAN.

WERNER SPANHOFF : Elementarbuch der deutschen.

SPRACHE (Grammar).

ANDERSEN : Bilderbuch ohne Bilder.

Elementary Physics and Chemistry.

There will be two papers, one in Physics and another in Chemistry, each of three hours' duration and a simple practical examination in each subject. 75 marks shall be assigned to each of the two papers and 25 marks to the practical examination in each subject.

(1) PHYSICS.

The following syllabus is prescribed :—

1. **GENERAL**—Simple ideas about Matter, Inertia and Force. Physical States of Matter, Unit of Length, Area and Volume. Measurements of Length, Area and Volume. Mass and Weight. Law of Universal Gravitation. Balance. Methods of Weighing. Density and Specific Gravity. Elementary idea about the Principle of Archimedes.
2. **HEAT**—Effect of Heat on Solids, Liquids and Gases. Change of Volume, Change of Temperature. Thermometer. Quantity of Heat. Specific Heat. Change of State. Melting Point. Boiling Point. Latent Heat. Evaporation. Condensation. Distillation.
3. **LIGHT**—Rectilinear Propagation of Light. Shadows. Reflection of light by Plane and Spherical Mirrors. Real and Virtual Images. Refraction of Light through a rectangular glass plate and prism. Images by Lenses.
4. **MAGNETISM**—Magnets and magnetic substances, Magnetic Force. The earth as a magnet. Earth's Magnetic force, only directive and not attractive. The Compass.
5. **ELECTRICITY**—The production of Electricity by Friction. Kinds of Electric Charges. Properties of a charged body. Conductors and Insulators. Electrostatic Induction. Gold-leaf-Electroscope. Electrophorus. Simple Frictional Machine, *e.g.*, Ramsden.

Electric Current. Simple Voltaic Cells. Effect of current on a magnetic needle. Galvanoscope. Simple experiments on heating and lighting effects by electric current.

The candidates shall be required to perform the important experiments, illustrating the principles studied.

Books suggested:—

GANOT: Natural Philosophy (Longmans, Green & Co.)

GREGORY AND HADLEY: A Class Book of Physics (Macmillan).

(2) CHEMISTRY.

1. The study of matter through the sense organs ; observation of the following properties :—

Colour ; transparency or opacity ; shape, size ; crystalline structure and texture (as seen through a lens if necessary) ; fracture or cleavage to be studied in common salt, mica and Iceland spar).

Sound produced by a body itself, or when it is let fall or struck.

Odour and taste, if any.

Cold or warm, ; yielding to pressure or not.

Weight and relative density. Balance.

Effect of heat and cold : melting and boiling points.

Solid, liquid, gas.

2. Solution, emulsion, mixture. Solubility in different liquids, water, alcohol, ether.

Filtration, crystallisation, distillation and sublimation.

- 1 and 2 to be studied with the following :—

Salt, nitre, chalk, marble, calcite (Iceland spar), lime, sand, quartz, blue vitriol, green vitriol, sulphur, rubber, carbonate of soda, iron, zinc, lead, tin, mixture of sand and sal ammoniac, camphor, shellac, oil, fat, charcoal.

3. The study of air, rusting of metals, active and inactive gases in air, burning of phosphorus in air, combustion and slow combustion studied with iron, magnesium, phosphorus, candle, charcoal, sulphur.
4. Oxygen gas prepared from red oxide of mercury, chlorate of potash and black oxide of manganese. Properties of oxygen.
5. Hydrogen gas prepared from zinc and sulphuric acid. Properties of Hydrogen.

6. Nitrogen gas prepared from air and from a mixture of ammonium chloride and sodium nitrite. Properties of nitrogen.
7. Chlorine and hydrochloric acid, preparation and properties.
8. Study of water. Action of sodium and magnesium on water. Action of steam on red hot iron. Electrolysis of water.
9. Carbonic acid gas, obtained by burning charcoal in air, and by the action of acids on chalk, carbonate of soda and *kankar*.
10. Elements and Compounds—Chemical combination and decomposition studied with reference to the foregoing substances.

A practical examination of a simple character will also be held in the course prescribed above.

Books suggested:—

SINCLAIR AND M'ALLISTER: First Year's Course of Chemistry.

L. M. JONES: Introductory Chemistry.

Botany:

The structure and germination of the seed. The conditions necessary for germination. Bean or Pea, Castor Oil Seed, and the Grain of Maize may be taken as examples.

The forms of normal and adventitious roots. The functions and adaptations of roots.

The stem and its branching. The bud. Underground stems and their distinction from roots. The modifications of the stem.

N. B.—The forms of roots and stems should be taught by taking familiar types. For instance, *Colocasia* [koshu] and *Zingiber* [ahdi] may be taken as examples of Corm and Rhizome respectively, etc., etc.

LEAF—Phyllotaxis; simple and compound leaf. The distinction of a compound leaf from a branch.

FLOWER and its morphology.

An intimate knowledge of the structure and habits together with correct technical description of the constituent parts of the following plants:

Sun-flower; Pea; Lady's Finger or *Bhindi*; Onion, Wheat or maize; *Neem* tree (*Melia*) *Ber* tree (*Zizyphus-jajuba*.)

FRUIT.—Definition. Kind of fruit. Seed and fruit dispersal.

PHYSIOLOGY—Simple experiments on Photosynthesis, Transpiration and Respiration.

There will be two papers, each of three hours' duration and a simple practical examination. Each of the two papers will carry 75 marks and there will be 50 marks for the practical examination.

Paper I shall deal with (a) the structure and germination of the seed, and (b) General Morphology and Physiology.

Paper II will test the candidate's knowledge of specified plants mentioned above (e.g. Sun-flower, Pea, Lady's Finger or *Bhindi*, Onion; Wheat or maize; *Neem* tree (*Melia*) *Ber* tree (*Zizyphus-jajuba*).

The subject should be taught as far as possible practically. There shall be no microscopic work.

Practical Work.

Candidates will be required to dissect (with or without the aid of a lens), describe and draw parts of plants prescribed in the Syllabus.

Further the candidates are expected to keep a record of all practical work done in the Laboratory in a notebook, which will be liable to examination by the University Examiners

The following books are suggested for the use of the teacher:—

J. M. LOWSON: A Text-book of Botany (Indian Edition).
OLIVER: Elementary Botany.

Drawing.

There shall be THREE papers, each of three hours' duration and each carrying 100 marks.

Paper I—Free-hand Drawing from the Flat—Light and Shade as in Macmillan's Official Drawing Books Nos. 9, 10, 14 and 19; and Birds and Beasts as in Vere Foster's Drawing Books Series as also copying to an enlarged and reduced scale.

Paper II—Model Drawing—Drawing of common objects, with light and shade, and the following geometrical solids:—Cubes, Pyramids, Cylinders, Cones and Spheres.

Paper III—Geometrical Drawing—

- i. The theory and use of instruments specially of Protractor and Marquise Scale.
- ii. Plain block-letter writing.
- iii. The whole of Practical Plane Geometry.
- iv. Drawing to scale viz Scale of Chords, Diagonal Scale, Plain Scale.

Book suggested :—

Geometrical Drawing for Arts Students, by J. H. Morris, specially edited for Indian students, by William Jesse, M.A., pp. 1 to 107 (omitting pp. 68 to 71, and pp. 117 to 120).

Manual Training.

The Examination will consist of—

- (i) one paper of three hours in drawing, carrying 100 marks, and
- (ii) a Practical Examination of four hours in Wood work also carrying 100 marks

1. Drawing :—

- (a) The use of Drawing Board, T Square, Set Square, Compasses and Simple Scales
- (b) Drawing in plan, elevation, and side-view of all models in the course. and in conventional Isometric projection or Oblique projection of those of a rectangular shape.

2. Woodwork .—

- (a) The use of the following tools :—

Jack Plane, Try Square, Marking Gauge, Steel Ruler, Marking Knife, Smoothing Plane, Tenon Saw, Bevel Square, Screw Driver, Firmer Chisel, Firmer Gauge, Hammer, Mallets, Bradawl, Compass, Gimlet, Bow-saw, Spoke, Shave, File, Brace and Bit.

(b) Care of Tools:—

The candidate should show his ability to put the common edged tools into fair workable condition.

(c) The following joints at least should be included amongst the models:—

Lap Joint, Butt Joint, Half-Lap, Housing, Mottise and Tenon. Half-lap Dovetail, Edge Dovetail, and Bridle Joint.

Books suggested:—

1. Manual Training for Indian Schools, by J. Y. Buchanan,

2. Manual of Instruction (Wood-work,) by J. Charles Pearson.

3. The "Self help" course of Wood-work, by E. J. Andrews

Agriculture and Surveying.

(*Course to be prescribed later on*).

Commerce.

There will be *two* papers, one on Book-keeping and the other on Commercial Correspondence, each of three hours' duration and each carrying 75 marks.

There will also be a practical test in Type-writing carrying 50 marks.

Book-keeping—Double Entry System.

Principles and Advantages of Double Entry Book-keeping
Books used and their purposes, Cash Book, Petty Cash Book, Purchases Day Book, Sales Day Book
Returns Books, Bills Receivable and Payable Books

Journal, Ledger, Real, Personal and Nominal Accounts; Consignments—Inwards and Outwards, Simple Banking Transactions. Bank Reconciliation Statement. The preparation of Trial Balance, Trading and Profit and Loss Accounts, and Balance Sheet. The nature and use of Bills of exchange and Promissory Notes. Provisions and Reserves; Suspense and Outstanding Accounts. Mercantile terms and abbreviations.

Books suggested:—ARTHUR FIELDHOUSE: Book-keeping Part I.

PITMAN: Book-keeping Simplified.

GRIERSON: Book-keeping.

Commerical Practice with Correspondence:—

Applications for situations and answering advertisements.

Inward and Outward Correspondence control. Copying and indexing. Letters, Filing and Indexing systems. Drafting of Simple Business and Official letters. Practices relating to customers' orders, Despatch, Shipping, Invoicing and statements. Preparation of telegrams and cablegrams, including a knowledge of simple codes. Ordinary postal regulations, use of postal forms, such as Money Order, (inland and foreign), V. P. P. Acknowledgment, Registration and Insurance forms. Post Office Savings Bank accounts. Simple duplicating and other labour saving appliances. Ordering of Goods. Preparation of ordinary commerical documents, such as Invoices. Different forms of Bills of Exchange and Promissory Notes. Statement of Account and Account Sales. Simple Banking transactions involving the nature and use of cheques, paying in slips and Bank Pass Book.

Books suggested:—F. HEELIS:—Import and Export Trade

ARTHUR FIELDHOUSE: Commercial
+ Practice with Correspondence

Typewriting:—

- (a) To type a manuscript letter of 200 words and a passage of 400 words at the rate of 20 words per minute— $\frac{1}{2}$ hour.
- (b) To type a tabular statement of not more than three columns— $\frac{1}{2}$ hour

There will also be a practical examination to test the candidate's ability regarding the use and identification and the mechanical construction of the machine and its parts.

Music and Domestic Science.

(Courses will be prescribed later on).

मुद्रक—माधव विष्णु पराङ्कर,
ज्ञानमण्डल यन्त्रालय, कबीर चौरा, काशी ।

Benares Hindu University



Prospectus of Studies

FOR

The Intermediate Examination of 1927

(ARTS & SCIENCE).

**(Including (1) Regulations for the Admission of Students
(2) General Rules for Examinations (3) Special
Regulations regarding the Admission of
Women Students and (4) Regulations
and Courses for the Previous
Examination in Samskrit).**

BENARES HINDU UNIVERSITY.

PROSPECTUS OF STUDIES FOR THE INTER-MEDIATE EXAMINATION, 1927.

EXTRACTS FROM CHAPTER XL OF
THE REGULATIONS.

Admission of Students.

1. Every candidate for any degree or diploma granted by the University shall, except when exempted under any of these Regulations, be required to pass the examination prescribed by these Regulations for admission to the University for the Faculty concerned before entering upon the course prescribed for such degree or diploma.

Chapter
XIV

A. Admission to the University courses in Faculties other than Theology and Oriental Studies.

2. A candidate may gain admission to the University courses in Faculties other than those of Theology and Oriental Learning either (i) by passing the Admission Examinations in Arts and Science prescribed in Chapter XXVII of these Regulations, or (ii) by passing any one of the other examinations as specified below, and fulfilling such other conditions as the Syndicate may impose.

Chapter
XIV

* * * *

12. Whether a candidate is a pupil of a recognised school or a private candidate, he shall satisfy the Syndicate as to his fitness for admission to the courses of the University by passing the Admission Examination, which shall be held at Benares, at times prescribed from time to time by the Syndicate.

Chapter
XIV

*(ii) Conditions to be fulfilled by candidates who pass some other examination.**

Chapter
XIV

13. The Syndicate may admit to the University courses, a candidate who has passed the Matriculation Examination of any Indian University established by Act of the Legislature or any School-Leaving Certificate Examination held in a British Province or in a State, which, on the advice of the Syndicate, shall at any time be recognised by the Government of India as qualifying for admission, or any one of the following examinations:

The Senior Oxford Local Examination.

The Senior Cambridge Local Examination.

The Final Examination prescribed for European Schools.

The Diploma Examination of a 'Huefs' College

The Syndicate may also so admit candidates coming from outside India who produce certificates of having passed examinations which, in the opinion of the Syndicate, are equivalent to the above mentioned examinations, or who have, in the opinion of the Syndicate, if necessary after examination, attained a degree of knowledge equivalent to that expected at the Admission Examination.†

* i.e. an examination other than the Admission Examination of the University.

† The following examinations have been recognised as equivalent to the Admission Examination of the Benares Hindu University

(1) The Matriculation Examination of every Indian University established by an Act of the Legislature

(2) The School Leaving Certificate Examination or the High School Examination of the United Provinces, provided that the candidate has fulfilled the conditions required for admission to the University of Allahabad.

(3) The School Leaving Examination of Ajmere-Merwara provided that the candidate has fulfilled the conditions required for admission to the University of Allahabad

(4) The School Leaving Certificate Examination of the Punjab

(5) The Senior Oxford Local Examination.

(6) The Senior Cambridge Local Examination.

(7) The Final Examination prescribed for European Schools.

14 The Syndicate shall have power, from time to time, to prescribe further conditions to be complied with by the candidates, and in especial, to prescribe further tests for candidates who have passed these examinations; provided that, if any such further test is held at a centre other than Benares, the arrangements (especially those regarding the supervision of the examination) shall be made in conjunction with the Local Government or the Government of the State concerned.

Chapter
XIV.

C.—Inter University Regulations.

24. Notwithstanding anything contained in these Regulations, a student, who is qualified under the foregoing Regulations for admission to the University, and who is a member of some other Indian University, shall not be admitted to the University, or any constituent College thereof, without the production of—

Chapter
XIV.

(1) a leaving or transfer certificate signed by the Principal of his last College and certifying

(8) The Diploma Examination of a Chiefs' College

(9) The Secondary School Leaving Certificate Examination of the Madras Presidency provided that the candidate has fulfilled the conditions regarded as necessary for admission by the University of Madras

(10) The School Final Examination of the North West Frontier Province provided the papers of the candidate have been classified under Article 151 of the Educational Code of that Province as A Excellent or B Satisfactory in one year in any complete group of subjects recognised for the Admission Examination of the Benares Hindu University.

(11) The School Leaving Certificate Examination of the Government of Bihar and Orissa

(12) The School Leaving Certificate Examination of Bombay, provided that the candidate has fulfilled all conditions demanded by the Bombay University in accepting the said examination for purposes of Matriculation, that is, he has passed at one and the same examination in English, additional language, Arithmetic, Algebra, Geometry and History and has produced a certificate from the Headmaster of a registered school showing that he possesses a satisfactory knowledge of Geography, Vernacular (or optional English) and Elementary Science, according to the courses prescribed by the Board and has carried out satisfactorily the practical courses prescribed in the latter subject

(13) The School Leaving Certificate Examination held in the States of Hyderabad, Cochin, Travancore and Mysore, provided the candidate has been declared eligible for admission to college classes by the University of Madras.

(14) The Entrance Examination of the Mysore University

to the satisfactory conduct of the student and mentioning the highest examination he has passed, and

(2) a certified copy of all the entries against his name in the Enrolment Register of his University, if such a copy is obtainable.

Chapter
XIV.

25. A student of some other Indian University shall in any case be admitted only at the beginning of the particular course which he proposes to take in the University.

REGULATIONS—CHAPTER XXVI.

Examinations.

General Rules.

1. Every candidate for any degree granted by the University, shall be required to pass an examination for admission to the University, as prescribed in Chapter XIV, the Intermediate Examination and the examination or examinations for the degrees prescribed by these Regulations.

2. All applications to appear in an examination shall be addressed to the Registrar, and shall be presented within such time and in such manner as may be prescribed by the Syndicate. Every such application shall be accompanied by a satisfactory character certificate from the head of the College or school to which the applicant belongs.

3. A candidate who fails to pass or who, from sickness or other cause, is unable to present himself for any examination, shall not receive a refund of his fee; but the Syndicate may, for sufficient cause, permit the candidate to present himself for the next ensuing examination, without payment of a further fee.

4. Except as provided in Regulation 3, a candidate, when admitted to one or more subsequent examinations or any part thereof, shall, before admission, pay the prescribed fee* for such examination, on each occasion when he is so admitted.

5. On receipt of the fee prescribed for the examination, the Registrar shall examine the application, which, if found to be in due form and in order, shall be registered in the register of candidates for such examination. The Registrar shall thereupon issue an admission card to the candidate, entitling him to sit for the said examination.

6. A candidate may not be admitted into the examination room, unless he produces to the officer conducting the examination, his admission card, or satisfies such officer that it will be subsequently produced.

7. A student shall be deemed to have pursued a regular course of study in a subject during a year or years, if he has attended at least seventy-five per cent of the course of lectures delivered in that subject during the year or years,

* The fee prescribed for the Intermediate Examination in Arts and Science is Rs 24/-.

and has produced a satisfactory character certificate from the Head of his College or School.

8. The Syndicate shall have power to condone any deficiency of attendance but only for cogent reasons.

9. Except when otherwise directed by the Regulations or by the examiner in the examination paper, every candidate shall answer his questions in the English language, in the examinations in Arts, Science and Law, and, in the examinations held in the Faculties of Theology and Oriental Learning, in such language as may be required in the question paper.

10. Candidates passing any University examinations will be placed in three Classes, namely, the First, Second and Third. The Syndicate shall, from time to time, prescribe conditions under which candidates will be placed in each of these Classes.

11. The term "year" in these Regulations means the term or terms of study or periods of study in the University or in one of its constituent Colleges, prescribed by the University, during a year of the Gregorian Calendar

REGULATIONS—CHAPTER XV.

Admission of Women Students and Special Regulations governing their residence, examination, etc.

1. Women candidates shall be eligible for admission to the University and to its examinations, degrees and diplomas.

* * * * *

3. With the permission of the Syndicate, women candidates shall be eligible to appear at all examinations of the University (whether for admission or for a degree or a diploma) as private candidates.

4. It shall be open to the Syndicate to make arrangements for the examination of women candidates in *pardah*.

5. Women candidates shall not be compelled to appear in person before the President of the Convocation for their diplomas.

6. The Syndicate shall, from time to time, make such arrangements for the residence of women students as may be necessary.

7. In other respects, the conditions governing women candidates and students shall be those prescribed in these Regulations for male candidates.

REGULATIONS—CHAPTER XXVIII

Intermediate Examination in the Faculties of Arts and Science.

1. The Intermediate Examination shall be held once a year in Benares, at such time and on such dates as the Syndicate may prescribe.

2. No candidate shall be admitted to this examination, unless he shall have fulfilled the conditions contained in Chapter XL (Chapter XIV) for admission to the courses in Arts and Science, and shall have prosecuted a regular course of study for two years in the University or a constituent College thereof, and unless he has produced satisfactory testimonials in the form prescribed by the Syndicate.

3. (a) Notwithstanding anything contained in Regulation 2, School-masters teaching in a recognised school, Demonstrators serving in the University or any of its constituent Colleges, may be admitted to the examination by the special grace of the Senate, provided that, by the date of the examination, not less than two academic years shall have elapsed since the date of their Matriculation and that the period of continuous service shall have been not less than 18 months.

(b) Before a candidate is permitted by the special grace of the Senate to present himself in any Science subject, he shall produce a certificate from the Principal of a constituent College of the University to the effect that he has completed the required course in the College Laboratory.

4. A candidate shall apply to the Registrar in such form as the Syndicate may prescribe. His application and fee shall be despatched through the prescribed channel, so as to reach the Registrar at least four weeks before the commencement of the examination.

5. A candidate who has completed a regular course of study in the University or a constituent college for the Intermediate examination but fails to pass or to appear may be admitted with the permission of the Syndicate to a

subsequent Intermediate examination on a new application and on payment of a further fee. Such a candidate shall not be required to prosecute a further course of study at the University or in a constituent college thereof.

6. The examination shall be conducted partly by means of papers and partly *à viva voce*, and in subjects which admit of it, candidates shall also be required to undergo a practical examination.

7. Notwithstanding any thing contained in the Regulations of this Chapter or of Chapter XXVI, a candidate who at his last appearance at the examination failed in one subject only, shall be admitted to a subsequent examination in that subject only and be declared to have passed the Intermediate Examination on obtaining at least 40 per cent of the total marks in that subject

3. (a) Notwithstanding anything to the contrary contained in Chapter XXIX* or Chapter XXXII† a candidate who has passed in all the subjects but one, may be allowed to keep terms for the B.A. or B.Sc. Examination and appear for, if otherwise eligible provided that he has passed in the remaining subject of the Intermediate Examination at least one academical year before he appears for the B.A. or B.Sc. Examination.

(b) A candidate who passes the Intermediate Examination in two or more stages according to the preceding Regulation shall not be classed or be eligible for any University awards connected with the examination.

9. The subjects of examination shall be the following:—

I. Compulsory subjects—

(a) English.

(b) Composition in a Modern Indian Language.

II. Optional subjects—

Three subjects, confined to one of the following Groups:—

i. e. Regulations for the B.A. Examination See the Prospectus of Studies for the B.A. and B.Sc. Examinations or the University Regulations published separately.

†i. e. Regulations for the B.Sc. Examination. See the Prospectus of Studies for the B.A. and B.Sc. Examinations or the University Regulations published separately.

Group A :—

- (c) Samskrit, and
 (d) (e) any two of the following subjects,
viz :—
 (1) Another Classical Language.
 (2) A Modern European Language.
 (3) Mathematics.
 (4) History.
 (5) Logic.
 (6) Drawing.
 (7) Manual Training.
 (8) Elementary Economics.
 (9) A Modern Indian Language and Literature.
 (10) Civics.

provided that a candidate, who has passed the Previous Examination in Samskrit† or has passed the Admission Examination or any examination accepted as equivalent thereto with Samskrit as one of his subjects, may take up, in addition to two optional subjects, under (d) and (e), a third optional subject under (d) and (e) in lieu of Samskrit.

Group B :—

- Any one of the following combinations.—
 (1) Physics, Chemistry, Mathematics.
 (2) Physics, Chemistry, Biology.

†The Regulations and Courses for the Previous Examinations in Samskrit are given as an Appendix at the end of this Prospectus

Syllabus and Text-Books.

English.

There will be *two* papers in text-books, *one* in poetry and *the other* in prose, each of three hours' duration and each carrying 100 marks. There will be two other papers also of the duration of three hours each. *one* containing exercises in general composition, including an essay (carrying 100 marks) and *the other* of subjects for essay-writing bearing on books for non-detailed study (carrying 100 marks). The books of poetry prescribed for the course will ordinarily include a play of Shakespeare, but questions in it will be limited to the interpretation of the text and to an appreciation of the story. The books prescribed for general study will, as far as possible, be representative of different kinds of prose composition.

N.B.—Alternative questions will be set, at least to the extent of half the number of questions in each paper

1. Poetry :—SHAKESPEARE: Julius Caesar.

English Narrative Poems Ed. by Sir Henry Newbolt
(Edward Arnold) :—

Tennyson's *Mort D' Arthur*; Arnold's *Sohrab and Rustum*; Keat's *Eve of St. Agnes*; Coleridge's *Rime of the Ancient Mariner*.

2. Prose :—ARTHUR HELPS: Essays written in the Intervals of Business.

Edited by Rowe and Webb (Macmillan).

BROWN AND WALKER: *An Intermediate course in Modern English.*
(Macmillan).

3. Non-detailed study :—

A Round of Tales edited by N. Henry and A. Treble.
(The Oxford University Press).

LORD AVEBURY: *The Pleasures of Life.*
(Macmillan)

MARGARET AVERY: *Six Great Scientists*
(Methuen.)

or

BRAND WHITLOCK: *Abraham Lincoln.*
(Nelson's Library).

Composition in a Modern Indian Language.

There will be one paper on Composition in a Modern Indian Language, of three hours' duration and carrying 100 marks.

The paper shall consist of three essays only, one general and two based on the subject-matter of the books recommended for study. The essays based on the books shall not demand a detailed knowledge of the contents of them.

N. B. Alternative subjects will be set for the essay at least to the extent of half the number.

The following books are recommended for general study as presenting models of composition and style:—

(A) HINDI

1. *Bhusma Pitamaha* by Dwarka Prasad Chaturvedi.
2. *Hindi Nibandhamala* Part 1 edited by Shyam-sundar Das.
3. *Anyokti Kalpadruma* by Dinadayala Giri.

(B) URDU.

1. *Yadgar-e-Ghalib* by Khwaja Altaf Husain Hali (Mohammedan College Book Depot, Aligarh) to end of Chapter on **نثر اردو اور اردو اس کا انتخاب** and excluding the Chapters dealing with Ghalib's Persian writings.
2. *Musaddas-e-Hali*.
3. *Ibn-ul-Waqt* by Maulvi Nazir Ahmad (Nazir Husain & Sons, Dariba Kalan, Delhi).

(C) PRAKRTI.

1. *Sakuntalopakhyana*
2. *Badulaputra Samvada*.
3. *Sankshipta Bharata*—Parras other than *Adi*, *Vana*, *Viraṭ* and *Udyoga*.
4. *Bhaṇubhaktiya Rāmāyana-Yuddha Kanda*.

(D) BENGALI.

1. *Charita Katha* by Ramendra Sunder Trivedi.
2. *Ramgarh* by Srimati Anurupa Devi.
3. *Adhunik Sahitya* by Rabindra Nath Tagore.
4. *Prabandha Panchaka* by Harihar Shastri.

(E) ASSAMESE.

1. *Sahitya Vichar* by Satya Nath Bora.
2. *Selections from Usha* (Articles *Dhan-o-Dhaner Vyavahar and Jivaner Uddeshya Ki?*)
3. *Jayamati* (Drama) by Lakshmi Nath Bezbarua.
4. *Assamese Language* by Hem Chandra Goswami.

(F) GUJARATI.

1. *Hasya Mandir* by Ramanbhai and Mrs. Vidya Ramanbhai.
2. *Narmad Jivan* by Navalram.
3. *Jaya ane Jayanta* by Nanalal D. Kavi.
4. *Swapna ni sundari* by K. H. Dhruva.

(G) MARATHI.

1. व्यास-रानडे-धर्मावर व्याख्याने ।
2. *Ragini* (रागिणी) by V. M. Joshi.
3. *Kavya ani Kavyodaya* (काव्य आणि काव्योदय) by P. N. Patwardhan.
4. *Marathi Vangmayache Abhyas* (मराठी वाङ्मयाचे अभ्यास) by H. N. Apte.

(H) SINDHI.

Prose :—

1. *Gulshankar* by Diwan Kewalram Salamatrai.
2. *Harishchandra* by Diwan Lilaram Singh Vatanmal

Poetry :—

Swami Part I compiled by Diwan Kauramal Chandanmal,

SHAH JO RASALO : Yaman Kalyan.

(I) TAMIL.

1. *Lilavati-Sulochana* by Rao Saheb P. Sambandam.
2. *Panchatantram* by Vidvan Thandavaraya Mudaliar edited with preface and notes by S. Anavaratavinayagam Pillai M. A., L. T. (Temple & Co Madras).
3. *The Two Orphans* by Pandit S. M. Natesa Sastriar (G. C. Loganadham Bros.)

(J) TELUGU.

1. *Chandragupta* by Bhogaraja Narayanamurti
2. *Bhojarajiyamu* by N. Kuppusamiah, B. A.

3. *Vikrama Simha Vijayamu* by K. Venkataramana Kavi, Nellore.

(K) KANARESE.

1. *Vidyarthi Karabhushana* by M. Venkata Krishnaya (Sadhvi Office, Mysore).
2. *Papa Punyc* by H. V. Subbaraganaja (Mangalore)
3. *Savitri* by M. Venkatesa Iyengar.

(L) MALAYALAM.

1. *Krishna Kanta's Will*—By T. C. Kalyani Amma (Mangalodayam Press, Trichur).
2. *Stories from Tagore* by P. Raman Menon (Vanikulambara Press, Trichur).

(M) ORIAH.

1. *Ramayana Katha* by C. Nandu.
2. *Bibasini* by Ramsankar Roy.
3. *Dakshinatyā Bhramana* by Sashi Bhusan Roy.

Sanskrit.

There will be *three* papers, each of three hours' duration, and each carrying 100 marks.

Paper I—

- (a) *Raghuvamsha*—Cantos IV and XIII.
- (b) *Kumarasambhava* Canto V.
- (c) *Kadambari*—The story of Mahasveta abridged (as in Prof. N. K. Bhattacharya's *Astapuspika—Mahasveta-vrittanta*).

Paper II

- (a) *Nagananda*.
- (b) *Venisamhara*—Acts IV and V abridged (as in Prof. N. K. Bhattacharya's *Astapuspika—Duryodhana-Nirveda*).

Paper III—

(a) *Grammar*—Apte's Guide to Sanskrit Composition is recommended.

(b) *Translation*—from English into Sanskrit.

N. B.—Sanskrit shall be written in the Devanagari script.

Arabic and Persian.

There will be *three* papers, each of three hours duration and each carrying 100 marks.

- (i) The *first* paper will be on the prescribed books of prose and poetry and will contain questions on grammar and prosody also.
- (ii) The *second* paper will consist of passages of unseen prose for translation from the Classical Language into English, or Urdu, or Hindi.
- (iii) The *third* paper will consist of two pieces of English, Urdu and Hindi prose for translation into the Classical Language, one in simple language and the other slightly more difficult.

(a) ARABIC.

Selections in Arabic Prose and Verse (Published in 1911, Anwar-i-Ahmadi Press, Allahabad).

Book recommended for supplementary reading :—

Quljubi Nawadir-i-Hikayat 1-150.

Grammar recommended :—

Mabadi-ul-Arabiya by Shartuni III (P. 1-96 Sarf).

(b) PERSIAN

Prose :—

(1) *Anwar-i-Suhaili*—first three chapters (omitting the preface).

(2) *Sawanih-i-Umrigi Shaikh Muhammad Ali Hazin* by Hazin himself.

Poetry :—

Rubaiyat-i-Umar-i-Khayyam. (The first 200 Rubaiyats).

Hafiz : to end of radif of ω ;

For rapid reading :—

Shah's Diary Book II.

Sukhandan-e-Faraz published by the Azad Book Depot Lahore (first five lectures only).

Modern European Languages.

There will be *three* papers, each of three hours' duration, and a *viva-voce* examination. Each paper will carry 90 marks and there will be 30 marks for the *viva-voce*.

- (i) The *first* paper will consist of passages for translation from the Modern European Language into English, partly from the books prescribed and partly unseen.
- (ii) The *second* paper will consist of passages for translation from English into the Modern European Language.
- (iii) The *third* paper will consist of an essay or letter to be written in the Modern European Language and of questions on Grammar.

TEXT-BOOKS.

(a) FRENCH

Berthon's Specimens of Modern French Prose (Macmillan & Co).

Berthon's Specimens of Modern French Verse (Macmillan & Co).

DAUDET: Tartarin de Tarascon.

(b) GERMAN

RICHL: Burg Neideck

FREYTAG: Die Journalisten.

EBNER-ESCHENBACH: Die Freiherren von Gempferlein.

Turner and Morshead's Selections of Poems from Schiller (Macmillan and Co).

Mathematics.

There will be *three* papers each of three hours' duration and each carrying 100 marks. *One* paper will be in Algebra and Trigonometry, the *second* in the Geometry of Conics and Solids and the Elements of Co-ordinate Geometry and the *third* on Elementary Mechanics.

The courses shall be as follows :—

Paper 1.

- (1) *Algebra*—Quadratic Equations involving two or more unknown quantities. The theory of Quadratic Equations and Expressions of the Second Degree. Imaginary Expressions. Arithmetical, Geometrical, and Harmonical Progressions. Permutations and combinations. Binomial and Exponential Theorems. Logarithmic Series and Elementary Determinants.

- (ii) *Plane Trigonometry*.—Including solution of triangles, and simple problems of inscribed, circumscribed and described circles. Logarithms. Graphical representation of the circular functions. Inverse circular functions.

Paper II—

- (i) Geometry of solids.
- (ii) Conic Sections. Parabola treated geometrically. Analytical treatment of the properties of the straight line, circle and of the Tangent and Normal properties of Parabola, Ellipse and Hyperbola.
- (iii) Calculus: Functions. Simple Limiting values Differential Coeff of x^n and of trigonometrical functions. Diff. Coeff. of Sum, Product and Quotient. Function of a function. Geometrical Interpretation of dy/dx . Differential co-efficient considered as a rate measurer Integration considered as the reverse of differentiation Differentials.

Simple Definite Integrals.

Integration by parts.

Book recommended: W. M. Baker's Calculus for Beginners.

Paper III—Elementary Mechanics—As in Loney's Mechanics for Beginners.

The following books are suggested:—

1. Algebra, Part II, by K. P. Basu.
2. Trigonometry, Part I, by Loney.
3. Trigonometry, by Hall and Knight.
4. Geometrical Conics, by Ashutosh Mukherji.
5. Co-ordinate Geometry by C. Smith.
6. Co-ordinate Geometry, by Chandi Prasad.
7. Elementary Mensuration, by Stevens,

History

There will be two papers in History each of three hours' duration and each carrying 150 marks.

- (i) *One paper* will be on Indian History from the earliest times to the present day.

(ii) For the *other* paper students shall take—
either.

(a) History of Greece to the death of Alexander
and

(b) History of Rome to the fall of the Antonines
or

(c) History of England from 55 B.C. to the present
day.

TEXT BOOKS.

Paper I—History of India.

VINCENT A. SMITH: The Oxford History of India.

The Students' Atlas of Indian History.
(Macmillan & Co.)

Paper II—

(a) *History of Greece*

J. B. BURY: A Short History of Greece for Beginners.

(b) *History of Rome.*

SHUCKBURGH: A Short History of Rome for Beginners.

WARDE FOWLER: Rome (Home University Library).

Atlas of Ancient and Classic Geography (Every Man's
Library).

(c) *History of England.*

WARNER & MARTEN: Ground Work of British History.

Logic.

There will be two papers, each of three hours' duration and each carrying 150 marks.

Paper I—Elements of Deductive Logic.

Paper II—Elements of Inductive Logic

N. B.—25 per cent of the total marks in each paper shall be reserved for Indian Logic.

The subject of Logic is to be studied as defined in the following syllabus:

DEDUCTIVE LOGIC.

1. The Problem of Logic. Its definition and scope. Relation of Logic to Psychology, to the Natural Sciences and to Philosophy. Logic as Science and Art. Logic as Material and Formal.
2. Thought : its essential nature and its forms. Laws of Thought, as Psychological and Logical. Thought and Language. Relation of Logic to Grammar. Judgment and Proposition. The parts of a Proposition.
3. Concept—its relation to judgment. Concept and name. Name and Term— their relation. Kinds of Terms. Nomenclature of Predicables. Definition and Division as Logical Processes.
4. Propositions and their classification. Distribution of Terms in a proposition. Opposition of proposition. Immediate Inferences.
5. Mediate Inferences and their varieties. Syllogism—its nature and its constituent parts. Rules of Syllogism. Figure and Mood. Determination of valid moods and its different methods. Reduction—its methods and use. Abbreviated and irregular forms of Syllogism. Trains of Reasoning. Hypothetical and Disjunctive arguments and their varieties.
6. Fallacies and their classification. The nature of each fallacy.

INDUCTIVE LOGIC.

1. The problem of Induction. The inductive process and its different forms. Assumptions of Induction. Laws of Causality and Uniformity of Nature.
2. Preliminaries of Induction. Observation and Experiment. Methods of Induction. The Deductive method of Induction.
3. Scientific and Imperfect Inductions. Induction by Enumeration and the use of Statistics, Induction by Analogy—its nature and value.
4. Hypothesis—its formation and use. Conditions of Legitimate Hypothesis. Explanation. Deduction and Induction and their connection.
5. Fallacies. Varieties of Inductive Fallacies and nature of each variety.

ELEMENTS OF INDIAN LOGIC.

1. बुद्धिः and ज्ञानम् ज्ञानम् as स्मृति and अनुभवः—the nature of each.
2. ज्ञानम् as अनुभवः—its two varieties as यथार्थः and अयथार्थः; the varieties of यथार्थज्ञानम् and the करणम् of each variety; करणम् and कारणम्—their relation; the nature and kinds of कारणम्
3. ज्ञानम् as प्रत्यक्षम्—its nature and varieties; the sources of प्रत्यक्षम्
4. ज्ञानम् as अनुमितिः—its nature and varieties; the process involved in each kind of अनुमितिः; हेतुमासः—its nature and varieties.
5. ज्ञानम् as उपमानम्—its nature and relation to analogy.
6. ज्ञानम् as शब्दम्—its nature; the function of शब्दः in ज्ञानम् the sources and varieties of शब्दज्ञानम्.
7. ज्ञानम् as अयथार्थम्—its varieties; the nature of each variety.

Books recommended for study in connection with the above syllabus :

(FREIGHTON : Introductory Logic (omitting Part III).

or

WELTON : Intermediate Logic.

and

ANNAMBHATTA : Tarkasamgraha.

- N. B.—Questions in Indian Logic are to be distributed between the two papers in accordance with the subject-matter of each.

Books that may be consulted :—

WELTON : Groundwork of Logic.

JEVONS : Elementary Lessons in Logic.

MINTO : Logic.

CARVETH READ : Logic—Deductive and Inductive.

FOWLER : Inductive Logic.

JEVONS : Studies in Deductive Logic.

KESHAVA MISRA : *Turkabhasa*.

Bhashaparichheda.

N. B.—The books recommended for study are not meant to be used as prescribed text-books but as indicating the general scope of studies in the subjects to which they relate. In Indian Logic, however the questions should be confined, as far as possible, to the books recommended.

Drawing.*(Course to be prescribed later on).***Manual Training.***(Course to be prescribed later on).***Elementary Economics and Indian Administration.**

There will be two papers each of three hours' duration and each carrying 150 marks:—

Paper I—Elementary Economics and Economic Geography.**Section A.—Elementary Economics.**

Subject matter of Economics; Fundamental conditions of Economic welfare; Causes of differences in productive power; Analysis of various forms of organisation for production; Conception of Diminishing Utility. Value in relation to Production, Exchange, Distribution and Consumption; Barter; Importance and functions of money; Various forms of money; need and functions of Banks; Distribution of income between individuals and classes; Causes of variations in wages, profits, interest and rent; The State and Economic welfare; Social and Economic ideals.

Note:—(1) The whole to be illustrated, as far as possible, with Indian examples.

(2) Only a general and elementary knowledge of the subject will be required and the candidates will not be expected to have a minute knowledge of detail, or to be able to deal with the more difficult questions of theory.

Section B.—Economic Geography of India.

Configuration of land along with the leading facts of the distribution of soils, rocks and minerals of economic importance; Effect of configuration on climate; Effects of configuration and climate on water supply in rivers and on mechanical sources of power; Influence of Physical factors on production, upon the distribution and character of population, upon labour supply and the value of land; Localisation of industry as determined by the foregoing factors; Transport, Trade centres and Trade routes, Geographical circumstances, influencing the economic and strategical position of India.

BOOKS RECOMMENDED.

1. MORELAND : Introduction to Economics for Indian Students.
2. HENRY CLAY : Economics for the General Reader.
3. EDWIN CANNAN : Wealth.
4. CARVER : Elementary Economics.
5. CHISHOLM : A Hand-book of Commercial Geography (Indian Part).
6. MORRISON : Indian Empire.

PAPER II—Indian Administration :

Historical sketch of the development of British system of Administration in India ; the control of Imperial Parliament ; the position of Secretary of State and the India Council ; India's place in the Empire, Dominion Status ; India Office and the office of the High Commissioner for India ; the Viceroy and his Council ; the Imperial Secretariat ; the relation between the Central and Provincial Governments ; the Governors and other heads of the Provinces ; Provincial Executives ; Provincial Secretariats ; Provincial autonomy ; District Officers and district administration - Local Self Government and the constitution and functions of municipal and Local Boards ; Imperial and Provincial Legislatures, their constitutions, powers and functions ; Imperial and Provincial Franchise ; Communal representation ; Financial relationships ; Indian Finance—Imperial and Provincial ; Administration and organisation of Justice ; Police and Jails ; Education ; Sanitation ; Medical Relief ; Public Works ; Famines ; Agriculture and Industry.

BOOKS RECOMMENDED

1. ANDERSON : Indian Administration.
2. KALE : Indian Administration (Fifth edition).
3. ILBERT : Historical Introduction to the Government of India.

A Modern Indian Language and Literature.**HINDI.**

(*Optional Course*).

There shall be *three* papers each of three hours' duration and each carrying 100 marks.

Paper I—Prose.

- (1) *Prachina Sahitya of Tagore* by Ramadahina Misra.
- (2) *Adarsa Jivana* by Ramachandra Shukla (Nagari Pracharini Sabha).
- (3) *Chhatrasala* by Ramachandra Varma (Hindi Grantha Ratnakara Series).
- (4) *Pratapa Nataka* by Radha Krishna Dasa (Nagari Pracharini Sabha).

Paper II—Poetry

- (1) *Kabir Vachanavali* Part I by Ayodhya Singha Upadhyaya (N. P. Sabha).
- (2) *Kavitavali* of Tulasi Dasa (N. P. Sabha Edition).
- (3) *Jayadratha Vadha* by Maithili Saran Gupta.
- (4) *Harishchandra Kavya* by Jagannath Das.
- (5) *Alamkara Chandrika* by Bhagwan Dina.

Paper III—Translation from Hindi into English and from English in to Hindi.

Civics.

There will be two papers in Civics, each of three hours duration and each carrying 150 marks.

Paper I. General Principles of Civics.

Nature—scope—Relation to History, Politics, Ethics
Social Science, Social Philosophy.

Humanity—Race—People—Nation—Community—Society
Family—Individual—The social unit—His social position and relations—His rights, duties, and obligations

State - Government- Origin of Government—Forms of Government—Functions of Government—Uses of Government.

Books recommended:—

1. THOMAS RALEIGH : Elementary Politics.
(Oxford University Press).
2. E. M. WHITE : Philosophy of Citizenship.
(George Allen & Unwin.)

Paper II—Indian Citizenship.

The Land—Physical features—A Geographical Unity— influence of these on the life of the people—and on other people—and vice versa—Relation to other geographical areas—Place in the world from the point of view of material resources.

Consciousness of the geographical unity among the people from the earliest times to the present day—Hindu times—Mohammedan period—present day.

The People—the movements of the peoples—the human reservoir—the races of man.

The elements in the population—aboriginal—Dravidian—Aryan—Hellenic—Hellenistic—Scythian—Mongolian—Mohammedan, including Turkish, Persian, Afghan, Arabian—European, including Portuguese, Dutch, French, British—Mutual influence of these—the fusion of races—its progress during historical times and the conditions that attended it—its retardation during modern days and the causes of this—the outlook for the future.

Cultural Unity—Languages—creeds—art—modes of life—food—dress—habits of thought and feeling and outlook on life—many tongues and beliefs but one life.

Eastern and Western Civilization—Asiatic and European culture—the meeting place of world cultures—the fusion of cultures—the dominant note of India and India's place in world civilisation—in the past—in the future.

Religious life. I. Hinduism (i) Vedic (ii) Jainism (iii) Buddhism—an aspect of Hinduism—no irreconcilable distinction—no persecution—foreign influences—world religion—Contributions of Buddhism and Jainism to Hinduism (iv) Pauranic Hinduism.

II. Mohammedanism.

III. Christianity.

The Bhakti movements—in South India—in Maharashtra—in Northern India—in Bengal—the re-approachment between Hinduism and Mohammedanism—Kabir, Nanak etc.—Sikhism—modern developments and sects—Arya Samaj—Brahmo Samaj.

Place of religion in national life—the distinctive note of India—India's message to the religious world—the hope of the future.

Social Life—*Caste*—origin—development—use and value—strength and weakness—Place in social organisation—the future—*family*—the basis of Ancient Society—the Hindu Joint family—its function—its present condition—its future—family and social morality and cohesion—other *social groups*—Provincialism and communalism—the question of inter-communal unity.

Characteristic social customs—marriage—the position of woman—purdah—the Depressed Classes—the problem of untouchability—other customs—the general tone of social life—the Reform movement—imitation—revival reconstruction, adaptation of basic principles of life to new needs—social reform in its national aspect apart from its communal aspect.

Sanitation and Hygiene—medical relief—social service—methods, indigenous and adopted—the growth of the social conscience.

Economical life—The Material Resources of India.

I. *Agriculture*—its place in national life—its organisation in its historical development—Land revenue administration at various epochs—the Village Panchayats—their history, present condition and future prospects.

II. *Industries*—Historical development—Ancient guilds—contrast with the West—adoption of Western forms of organisation—Industrialisation—use and abuse—benefits and dangers—place in national life—Industry and Art—manual labour and machinery—cottage industries—the future of industry.

III. *Trade and Commerce*—History—Ancient guilds—regulation of trade—Ancient Shipping, commerce and maritime enterprise—colonization—the place of Eastern commerce, in the world History, Indian commerce past and present—the needs of the future.

IV. *Emigration*—Indians outside India—the imperial problem of emigration—its prospects.

Intellectual life—Literatures, ancient and modern—their characteristic Indian note—the question of common language and script.

Aesthetic life—Art—the distinctive note of Indian Art—sculpture—painting—architecture—music—foreign elements—the synthesis of many elements by a common spirit.

Education—Hindu Education—intellectual development in philosophy, science, art, literature and all other branches of knowledge and thought—Education in Mohamedan times—Education to-day—the question of National Education.

The Press and the Platform:—Freedom of speech—public education—responsibility of the press and public agitation.

Political life. The Hindu state—prolific experimentation in forms of political administration—advanced views in administration—the Ideal form of Government—*The Mohamedan state*—the Islamic state—the place of Akbar—Mohamedan contribution to Indian Political life—contribution of the Marathas—contribution of the Sikhs

British Administration in India—the Problem of Indian Swaraj.

India's place in the Commonwealth—International position.

Books recommended :

- 1 ANNIE BESANT : India—a Nation.
2. SISTER NIVEDITA : Civic and National Ideals.
3. MARRIS AND GARNER : Civil Government.
- 4 ANDERSON : British Administration in India.

BIOLOGY.

There will be *two* papers, *one* in Botany and *another* in Zoology each of three hours' duration. There will also be *practical* test in both branches. Each paper will carry 100 marks and there will be 100 marks for the practical examination.

(a) BOTANY.

There will be one paper and a practical examination of not more than three hours.

Distinction between living and non living matter; the distinctive properties of protoplasm; distinctions between animals and plants.

A general outline of the study of the living plant machinery with a view to understand the way in which it is constructed and the various life-phenomena it exhibits including:—

- (a) An elementary knowledge of the external structure (Morphology) of its various parts such as, Root, Stem, Leaf, Inflorescence, Flower, Ovule, Fruit, and Seed. The differentiation and development of these parts from the seed during germination. The origin and evolutionary tendencies in these parts.
- (b) An elementary knowledge of the structural units, cells (Histology) of the plant body and the way in which they are organised to give a co-ordination of functions:—The vegetable cell, its contents and their recognition by micro-chemical tests, its method of division and its general physiology, such as, Osmotic pressure, Permeability, etc; formation of important tissues, such as, the Meristematic Tissues and their differentiation into the various permanent tissues: the formation of important tissue-systems, such as, the Dermal, the Mechanical, the Absorptive, the Vascular, the Assimilatory, the Respiratory, and the Sensory tissue systems.
- (c) An elementary knowledge of the functions carried on by the living plant together with a study of its energy relations (Elements of Plant Physiology)—The Physiology of the cell; a general survey of the structure of the plant body as adapted to its functions; the energy and material balance-sheet of the plant body including a discussion of:—1. the gain of matter to the plant body by processes of absorption by roots and other organs, 2. the movements of materials to places where they are required by processes of Root-pressure, Transpiratory current, Cell-diffusion etc, 3. the gain of potential energy by conversion of simple substances into complex organic living and non-living matter by constructive processes of metabolism in Autotrophic and Heterotrophic plants (CO_2 assimilation, Parasitism, Saprophytism &c. 4. the expenditure of energy in performing work of various kinds such as growth, irritability, reproduction etc., and 5. the removal of waste matter in the form of secretion, excretion &c.
- (d) An elementary knowledge of:—the physiology of Reproduction, the Sexual and Asexual modes of Reproduction and their significance; Pollination and Fertilisation and the agencies by which these are secured.

Methods of propagation in space by dispersal of Fruits and Seeds

- (e) Outlines of Evolution :—Evidences of Evolution; pre-Darwinian, Darwinian, and post-Darwinian conceptions of Evolution; Heredity and Mendelism and its applications.

General outlines of the Classification of the plant kingdom illustrated by a knowledge of the structure, functions, life-history, and relationships of :—

Bacillus; Yeast; Phytophthora; Mucor; Euglena; Ulothrix; Spirogyra; Riccia; Funaria; Pteris; Cycas; Nymphaea; Argemone; Pisum; Picinus; Cucurbita; and Helianthus.

Outlines of the principles of systematic classification of the Angiosperms into principal groups.

PRACTICAL WORK.

Candidates shall be required to examine microscopically the gross parts of, and to dissect and describe specimens of plants included in the above syllabus. They shall also be required to perform simple laboratory experiments to understand the various physiological processes carried on by the plant.

They shall also be expected to keep a record of all practical work done in the laboratory in a note-book, which will be liable to examination by the University Examiner.

The following books are suggested as suitable:

TANSLEY: Elements of Plant Biology.

THODAY: Botany, A Text-book for Senior Students.

PFELETERER: Glimpses into the Life of Indian Plants

GAGER: Fundamentals of Botany.

DUDGEON: Guide to Intermediate Practical Botany

(b) ZOOLOGY,

Definition and scope of Zoology Nature of Protoplasm.

The structure and life history of Amoeba. Structure of the Cell; Cell division and Gametogenesis; Copulation and Fertilisation Segmentation and formation of germ layers. Structure and functions of the animal tissues. Structure and life-history of Hydra, Pheretima or Eutyphæus, and Cockroach.

The Anatomy and Osteology of the Frog and the Rabbit

The elementary physiology of the various organs, as illustrated by the Frog and the Rabbit.

Main features of the larval History of Frog, the embryonic membranes and placenta of the foetus of Rabbit.

A general classification of the Animal Kingdom with the characteristics of the principal phyla.

Practical Work.

The candidates will be required to examine microscopically, to dissect and to describe the animals named in the syllabus. They are also expected to keep a record of all practical work done in the Laboratory in a note-book which will be liable to examination by the University examiners.

The following books are suggested :—

BORRADILE: Manual of Zoology (Oxford Med. Pub.)

MARSHALL: Frog.

MARSHALL AND HURST: Practical Zoology.

PARKER AND BHATTIA: Text-book of Zoology for Indian Students.

G. C. BOURNE: Comparative Anatomy of Animals in 2 Vols. (G. Bell & Sons).

Physics.

There will be *two* papers, each of three hours' duration. There will also be a *practical* examination. Each paper will carry 100 marks and there will be 100 marks for the practical examination.

1st Paper—Elementary Experimental Mechanics, Hydrostatics, Heat and Sound.

2nd Paper—Light, Electricity and Magnetism.

The following Syllabus is prescribed :

EXPERIMENTAL MECHANICS.

Measurement of Length. Mass and Time, Fundamental notions of Velocity and Acceleration. Composition of Velocities and Accelerations. Laws of motion. Weight and Mass. Force. Equilibrium of Forces. Composition and Resolution of Forces. Parallel Forces, Moments, Couples, Balance, Work. Potential and Kinetic Energy. Conservation of Energy. The Law of Gravitation. Centre of Gravity. Simple Pendulum. Simple machines of common use. Friction, Simple Harmonic Motion.

EXPERIMENTAL HYDROSTATICS.

Fluid Pressure. Pressure in Liquids. Principle of Archimedes. Specific Gravity. Principle of Floating Bodies. Hydrometers. Atmospheric Pressure. Manometer and Barometer. Density of Air. Boyle's Law. Simple Water-Pumps and Air-Pumps. Hydraulic Press. Syphon. Diving Bell. Principle of Aeroplanes.

HEAT.

Temperature and Thermometers. Measurement of Expansion of Solids, Liquids and Gases. The Gas Equation $pV = RT$ and its application. Measurement of Heat. Specific Heat and Capacity for Heat. Change of State. Melting and Boiling Points and their dependence on Pressure. Regelation. Latent Heat. Freezing. Saturated and Unsaturated Vapours. Vapour Pressure. Hygrometry. Atmospheric Phenomena. Weather Reports. Conduction, Convection and Radiation. Cooling. Reflection and Absorption of Radiant Heat. Relation of Heat and Work. Mechanical Equivalent of Heat. Definitions of Specific Heat at constant Volume and at constant Pressure. Principle of Steam and Internal-Combustion Engines. Nature of Heat. Descriptive Explanation of Pressure. Change of State, Conduction etc., on the Kinetic Molecular Theory.

LIGHT.

Rectilinear Propagation of Light, Eclipses, Photometry. Laws of Reflection and refraction of Light. Mirrors and Lenses, Simple Optical Instruments e.g., Telescopes, Microscopes, Camera, Magic Lantern and Cinematograph. Defects of Vision and their Remedies. Binocular Vision. Dispersion of light by Prisms. Spectrometer. Continuous and Line Emission Spectra. Absorption of Light and Colours of Objects. Nature of Light. Foucault's Method of determining the Velocity of Light.

SOUND.

The Propagation and the Velocity of Propagation of Sound in Air. Applications of the Formula $V = \sqrt{\frac{E}{D}}$. Amplitude, Wave-length and Frequency. Reflection, Refraction and Interference of Sound Waves, Beats, Vibration of Strings and use of the Formula $N = \frac{1}{2l} \sqrt{\frac{T}{M}}$. Vibrations of open and closed Pipes. Resonance. Resonance Tube, Diatonic Scale and

Musical Intervals. Harmonics. Simple Musical Instruments of common-use Gramophone.

MAGNETISM.

Simple Magnet. Methods of making a Magnet: Definition of Unit Magnetic Pole, Magnetic Moment. Lines of Force, Terrestrial Magnetism. Horizontal Intensity. Dip and Declination.

ELECTRICITY.

Frictional Electricity, Methods of Production. Conductors and Non-Conductors, Induction, Electroscopes, Charging by Conduction and Induction. Condensers, Unit of Charge and Potential, Electrophorus, Influence Machine. Lightening and Lightening Conductors.

Voltaic cell. Electric Current and its Magnetic Effect, Common Primary cells, Accumulators, Tangent Galvanometer, Difference of Potential. Electro-motive Force. Ohm's Law. Resistance. Resistance in series and parallel. Wheatstone's Bridge. Electrolysis. Electroplating. Heating Effect of Current. Joule's Law. Electric Lamps and Arcs. Stoves and furnaces. Electro-magnets. Electric-Bell. Principles of Telegraphy and Telephony. Induction Coil. Simple Dynamo Effect of a Magnetic Field on Electric Currents. Moving Coil Galvanometer. Ammeter and Voltmeter. Electric Motor and Fans. Thermopile and Thermo-electric Thermometers. Simple ideas about Cathode rays. Electrons, X-Rays. Wireless Telegraphy, and Radio-active Transformations

The following books are recommended :—

Brown : Experimental Science Part I, Physics.

Section 5	..	Light.
" 6	...	Sound.

Brown : Experimental Science, Part III.

Electricity and Magnetism.

(Camb. Univ. Press).

Hadley :—Everyday Physics (Macmillan).

LIST OF EXPERIMENTS FOR PRACTICAL WORK.

1. Use of Vernier Callipers and Screw Gauge.
2. Verification of Archimedes' Principle.
3. Specific Gravity by Hydrostatic Balance.
4. Verification of the Law of Floating Bodies.
5. Construction of a Hydrometer.

6. Determination of Pressures by U. Tube Manometer.
7. Boyle's Law.
8. Density of Air.
9. Density of a Liquid by Hair's Tube.
10. Simple Pendulum.
11. Parallelogram of Forces.
12. Moments of Forces.
13. Linear Expansion of Solids.
14. Expansion of Air.
15. Determination of Specific Heat.
16. Determination of Latent Heat of Steam.
17. Cooling Curve and Melting Point.
18. Mechanical equivalent of Heat (lead-shot and card-board tube).
19. Preparation of Weather Report.
20. Photometer.
21. Focal Length of Concave Mirror.
22. Focal Length of Convex Lens.
23. Construction and use of Magic Lantern.
24. Construction of Telescope and Microscope.
25. Spectrum.
26. Resonance Tube.
27. Sonometer.
28. Lines of Force due to a Magnet.
29. Electroscope.
30. Oerstead's Experiment.
31. Reduction Factor of Tangent Galvanometer with an Ammeter.
32. Resistance. Voltmeter and Ammeter method. Internal Resistance of Batteries.
33. B. A. Bridge. Resistance in Parallel and in Series.
34. Experiments on Induction.
35. Electrolysis.
36. Heat generated by Electric current.
37. Construction of a Dynamo or Motor.

Chemistry.

There will be *two* papers, each of three hours' duration. There will also be a *practical* examination. Each paper will carry 100 marks and there will be 100 marks for the practical examination.

The following course has been prescribed, in addition to what has been indicated for the Admission Examination : —

Chemical action. Mechanical mixture and compounds. Laws of chemical combinations by weight and by volume. Laws of Charles and Boyle, Density of

gases. Vapour pressure. Graham's Laws of Diffusion. Atomic theory and Avogadro's hypothesis. Atoms, molecules, atomic and molecular weights determination. Dulong and Petit's Law. Chemical symbols, formulæ, equation. Valency, equivalent weights and their determination. Elementary ideas of the Kinetic theory of gases, of the law of mass action. Ionic theory (in solutions) and dissociation (gaseous). Calculations of an easy nature.

Flame : Bunsen burner, blowpipe flame, ignition temperature. Davy's safety lamp, oxidation, reduction periodic classification (treated with reference to the elements prescribed below).

Study of the following elements and compounds—

Hydrogen : oxygen, ozone, water, hydrogen-peroxide, oxides (acidic, basic, neutral); peroxides, bases, acids, neutralisation.

Nitrogen : its oxide ; ammonia , nitric and nitrous acids , nitrates and nitrites , action of heat on nitrates , atmosphere.

Chlorine : its monoxide and peroxide : hydrochloric, hypochlorous, chloric acids, and their salts, perchlorates.

Bromine : hydrobromic, hypobromous, and bromic acids and their salts.

Iodine : hydriodic and iodic acids ; iodates, iodides , iodine pentoxide,

Fluorine : hydrofluoric acids and fluorides.

Sulphur : its allotropic modifications ; sulphuretted hydrogen ; sulphur di-and tri-oxides. Liquifaction of sulphur dioxide ; sulphurous and sulphuric acids , sulphides ; sulphites ; sulphates ; manufacture of sulphuric acid-chamber process, contact process.

Carbon : its allotropic modification ; oxides of carbon ; coal gas ; methane ; ethylene and acetylene.

Phosphorus : its allotropic modifications : phosphoretted hydrogen ; tri and penta oxides ; orthophosphoric acid and the phosphates of the alkali and the alkaline earths ; tri-and penta chloride of phosphorus.

Silicon : Silica, silicic acid and the silicates ; silicon fluoride , dialysis ; glass and porcelain.

Potassium : and sodium ; their oxides ; hydroxides, chlorides, sulphates, carbonates, nitrates, chlorates and perchlorates,

Ammonium salts, chloride, sulphate, nitrate and carbonate

Calcium, Barium, Strontium : their oxides and hydroxides, chlorides ; sulphates, nitrates, carbonates, bleaching powder and calcium carbide.

Magnesium, Zinc, Cadmium and Mercury ; their oxides, chlorides and sulphates ; sulphides of zinc, cadmium and mercury, mercury nitrates.

Arsenic, antimony and bismuth ; their oxides, chlorides and sulphides ; bismuth nitrates and the hydrides of antimony and arsenic.

Aluminium : its oxide, hydroxide, sulphate and chloride : alum.

Boron, boric acid, borax.

Copper ; its oxides, chlorides, sulphate and nitrate ; brass ; bronze.

Silver : its nitrate, chloride, bromide, iodide.

Tin : its oxides, chlorides and sulphides.

Lead : its chlorides, iodide, sulphate, nitrate, acetate, carbonate.

Iron : its oxides, sulphates, chlorides, sulphides, cast iron, wrought iron ; steel.

The metallurgical extraction of the following metals :—

Iron, copper, zinc, mercury, lead, aluminium, tin, magnesium, sodium.

Simple compounds such as oxide, chloride, sulphate, nitrate and sulphides of chromium, manganese, nickel and cobalt, alkali permanganates, dichromates and chromates

Determination of the composition and the molecular formula of the more important compounds in the syllabus for example :

Water, ozone, ammonia, hydrochloric acid, methane, sulphur dioxide, etc.

Elementary Organic Chemistry.

Purification of organic substances. Detection, and estimation of C, H, N, Cl, and S in organic compounds.

Isomerism, Polymerism. ..

... Study, including the structural formulae of the following substances :—

Methane, ethane, ethylene, acetylene.

Methyl alcohol, ethyl alcohol, ethyl ether.

Ethyl chloride, ethyl iodide, chloroform and iodoform.

Formaldehyde, acetaldehyde, chloroform and iodoform.

Formic acid, acetic acid, benzoic acid, ethyl acetate, acetyl chloride, acetic anhydride and acetamide.

Ethylamine.

Study of the general properties and common uses of the following :—

Urea, oxalic acid and tartaric acid.

Glycerol, oils and fats.

Glucose, fructose, cane-sugar and starch.

Coal tar, benzene, aniline and phenol

General principles of—

- (i) Stereochemistry as illustrated by lactic and tartaric acids.
- (ii) Diazotisation.
- (iii) Fermentation
- (iv) Saponification

Practical Work.

Candidates are expected to perform the following experiments in the Laboratory :—

1, Simple gas preparation and the fitting up of the apparatus needed for the same, including glass bending, joining two straight glass tubings and simple glass blowing.

2. Detection by dry and wet methods of the following radicals in simple salts :—

K, Na, NH₄, Ca, Sr, Ba, Mg, Zn, Hg, Al, Cu, Ag, Pb, Fe, As, Sb, Bi, Sn, Cd, Cr, Mn, Co, Ni, S, So₄, No₃, Cl, Br, I, CO₃, ClO₃, SO₃.

3. Volumetric analysis. Preparation of standard solutions of acids and alkalies and simple estimation of acids and alkalies in their solutions.

Determination of equivalent weights of magnesium, zinc and copper.

4. Determination of the loss in weight on heating of magnesite and gypsum
 5. Preparation of simple salts, for example :
Barium Chloride from Barium Sulphate,
Copper Sulphate from Copper ;
Zinc Sulphate from Zinc.
- N. B.—Quantities of the material and the yield to be measured.

Attention is directed to the importance of candidates keeping complete records of their practical work. When presenting themselves for examination, they are required to submit note-books containing records of the practical work performed during the last two years of training for inspection by the examiners, who will take them into account in deciding the examination. *Candidates will be allowed to use their own note-books at the time of the practical examination.* These note-books will only contain the account of the actual work performed by the candidate.

Books recommended :—

ROSCOE AND LUNT : Inorganic Chemistry for Beginners.

ROSCOE AND HARDEN : Inorganic Chemistry for Advanced Students.

HOLLEMANN AND COOPER : Text-book of Inorganic Chemistry.

E J LEWIS : The Elements of Organic Chemistry
(University Tutorial Press, London)

F. JONES : A Junior Course of Practical Chemistry.

BRUCE AND HARPER : Practical Chemistry.

P. C. ROY : Practical Inorganic Chemistry.

APPENDIX.

The Previous Examination in Samskrit.

(A) REGULATIONS—CHAPTER XXVIIA.

1. There shall be a Previous Examination in Samskrit held at least twice a year, at such times and on such dates as the Syndicate may prescribe for such candidates as desire to take up one of the optional subjects prescribed in Group A (d) and (e) of Regulation 9 of Chapter XXVIII of the Regulations for the Intermediate Examination, or any of the optional subjects prescribed in Regulation 7 II (iv) of Chapter XXIX (Regulations for the B A. Examination) in lieu of Samskrit.

2. A candidate shall apply to the Registrar in such form as the Syndicate may prescribe. His application shall be despatched through the prescribed channel so as to reach the Registrar at least four weeks before the date of the examination.

3. A candidate who fails to pass, may be admitted to a subsequent examination, on a new application.

4. The examination shall be conducted by means of one written paper only.

5. The course prescribed for this examination shall cover some typical declensions and conjugations and simple *samasa*s and easy selections in prose and poetry

(B) COURSES

There will be only one paper of three hours' duration and carrying 100 marks.

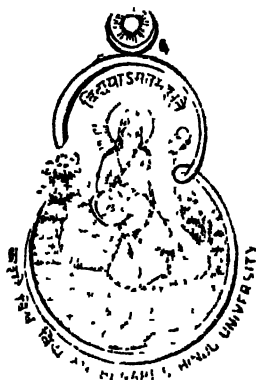
Books prescribed :—

Selections from the Hitopadesa and the Nalopakhyaṇa (University Book Depot).

In Samskrit Grammar, students should acquaint themselves with typical declensions such as those of राम, मुनि, पितृ, कृता, नदी, फल, मधु, and conjugation of roots like हृस् in लट्, लङ् लोट्, and लृट् and also of कथ, वृत्, विश् कृ in लट्, only and simple *samasa*s अव्ययीभाव, तत्पुञ्ज (including कर्मधारय and द्विगु) इन्ध and बहुव्रीहि with examples.

मुद्रक—माधव विष्णु पराङ्कर,
ज्ञानमण्डल यन्त्रालय, कबीर चौग, काशी ।

Benares Hindu University.



Prospectus of Studies

FOR

The B.A. & B.Sc. Examinations of 1927

(Including (1) General Rules for Examinations

(2) Special Regulations regarding the
Admission of Women Students and

(3) Regulations and Courses

for the Previous

Examination

in

Sanskrit).

BENARES HINDU UNIVERSITY.

Prospectus of Studies for the B. A. & B. Sc. Examinations of 1927.

REGULATIONS--CHAPTER XXVI

Examinations.

General Rules

* * *

2. All applications to appear in an examination shall be addressed to the Registrar, and shall be presented within such time and in such manner as may be prescribed by the Syndicate. Every such application shall be accompanied by a satisfactory character certificate from the head of the College or school to which the applicant belongs.

3. A candidate who fails to pass or who, from sickness or other cause, is unable to present himself for any examination, shall not receive a refund of his fee; but the Syndicate may, for sufficient cause, permit the candidate to present himself for the next ensuing examination, without payment of a further fee.

4. Except as provided in Regulation 3, a candidate, when admitted to one or more subsequent examinations or any part thereof, shall, before admission, pay the prescribed fee* for such examination, on each occasion when he is so admitted.

5. On receipt of the fee prescribed for the examination, the Registrar shall examine the application, which, if found to be in due form and in order, shall be registered in the register of candidates for such examination. The Registrar shall thereupon issue an admission card to the candidate, entitling him to sit for the said examination.

* The fee prescribed for the B.A. & B.Sc. examination is Rs. 36/- only. A fee of Rs. 5/- extra shall be charged for each subject in which the candidate wishes to take Honours.

6. A candidate may not be admitted into the examination room, unless he produces to the officer conducting the examination, his admission card, or satisfies such officer that it will be subsequently produced.

7. A student shall be deemed to have pursued a regular course of study in a subject during a year or years, if he has attended at least seventy-five per cent of the course of lectures delivered in that subject during the year or years, and has produced a satisfactory character certificate from the Head of his College or School.

8. The Syndicate shall have power to condone any deficiency of attendance but only for cogent reasons.

9. Except when otherwise directed by the Regulations or by the examiner in the examination paper, every candidate shall answer his questions in the English language, in the examinations in Arts, Science and Law, and, in the examinations held in the Faculties of Theology and Oriental Learning, in such language as may be required in the question paper.

10. Candidates passing any University examinations will be placed in three Classes, namely, the First, Second and Third. The Syndicate shall, from time to time, prescribe conditions under which candidates will be placed in each of these Classes.

11. The term "year" in these Regulations means the term or terms of study or periods of study in the University or in one of its constituent Colleges, prescribed by the University, during a year of the Gregorian Calendar.

REGULATIONS- CHAPTER XV.

Admission of Women Students and Special Regulations governing their residence, examination, etc.

1. Women candidates shall be eligible for admission to the University and to its examinations, degrees and diplomas.

* * * * *

3. With the permission of the Syndicate, women candidates shall be eligible to appear at all examinations of the University (whether for admission or for a degree or a diploma) as private candidates.

4. It shall be open to the Syndicate to make arrangements for the examination of women candidates in *pardah*.

5. Women candidates shall not be compelled to appear in person before the President of the Convocation for their diploma.

6. The Syndicate shall, from time to time, make such arrangements for the residence of women students as may be necessary.

7. In other respects, the conditions governing women candidates and students shall be those prescribed in these Regulations for male candidates

CHAPTER XXIX

Bachelor of Arts.

1. The examination for the degree of Bachelor of Arts shall be held once a year in Benares, at such time and on such dates as the Syndicate may prescribe.

2. No candidate shall be admitted to the examination for the degree of Bachelor of Arts, unless he has passed the Intermediate Examination of the University in the Faculty of Arts or of Science, or, in special cases, by permission of the Syndicate, the Intermediate Examination of some other Indian University or the Board of High School and Intermediate Education established by Act of the Legislature,* or the First Year Certificate Examination of the Mysore University and unless he has thereafter prosecuted a regular course of study for not less than two years in the University or in a constituent College of the University.

3. Notwithstanding anything contained in Regulation 2, School-masters teaching in a recognised school, Demonstrators serving in the University or any of its constituent Colleges, may be admitted to the examination by the special grace of the Senate, provided that, by the date of the examination, not less than two academical years shall have elapsed since the date of their passing the Intermediate Examination and that the period of continuous service shall have been not less than 18 months.

4. A candidate shall apply to the Registrar in such form as the Syndicate may prescribe. His application and fee shall be despatched through the prescribed channel, so

* Notwithstanding anything contained in these Regulations, a student, who is qualified under the foregoing Regulations for admission to the University, and who is a member of some other Indian University, shall not be admitted to the University or any constituent College thereof, without the production of --

(1) a leaving or transfer certificate signed by the Principal of his last College, and certifying to the satisfactory conduct of the student and mentioning the highest examination he has passed, and

(2) a certified copy of all the entries against his name in the Enrolment Register of his University if such a copy is obtainable.

A student of some other Indian University shall in any case be admitted only at the beginning of the particular course which he proposes to take in the University.

as to reach the Registrar at least four weeks before the commencement of the examination

5. A candidate who has completed a regular course of study in the University or in a constituent college for the examination of Bachelor of Arts but fails to pass or to appear may be admitted with the permission of the Syndicate to a subsequent examination for the same degree on a new application and on payment of a further fee. Such a candidate shall not be required to prosecute a further course of study at the University or in a constituent college thereof.

6. The examination shall be conducted partly by means of papers and partly *in a voce*.

7. The subjects of examination shall be the following:—

I. Compulsory subjects—

- (i) English.
- (ii) Samskrit.
- (iii) Composition in a Modern Indian Language.

II. Optional subjects—

- (i) any one of the following subjects:—
 - (a) Any other Classical Language
 - (b) A Modern European Language.
 - (c) Philosophy.
 - (d) Mathematics.
 - (e) Political Economy and Political Philosophy.
 - (f) History.
 - (g) A Modern Indian Language and Literature.

provided that a candidate, who has passed the Previous Examination in Samskrit* or has passed the Admission Examination or any examination accepted as equivalent thereto, or has passed the Intermediate Examination with Samskrit as one of his subjects, may take up, any one of the optional subjects in lieu of Samskrit.

8. Notwithstanding anything contained in this Chapter or in Chapter XXVI† a candidate who at his last appearance at the examination failed in *one* subject only, shall be admitted to a subsequent examination in *that* subject only and be declared to have passed the B.A. Examination on obtaining at least 40 per cent of the total marks in that subject

*The Regulations and Courses for the Previous Examination in Samskrit are given as an Appendix at the end of this Prospectus.

†Vide pp. 1-2 of this Prospectus.

9. A candidate who passes the Examination in two or more stages according to the preceding Regulation shall not be classed or be eligible for any University awards connected with the examination

10. A candidate may obtain Honours in any subject if he passes in the First Division in that subject as well as in a more advanced course in that subject prescribed for the purpose provided he obtains at least 45 per cent marks in the aggregate of the remaining subjects. Composition in a Modern Indian Language shall not count as an independent subject for this purpose.

Syllabus and Text-Books.

English.

There will be *four* papers in all, each of three hours' duration two in text-books—poetry and prose respectively (each carrying 100 marks) and two in essay-writing, one general (carrying 100 marks) and the other relating to books prescribed for general study (carrying 100 marks). The books prescribed in poetry will ordinarily include one of the more difficult plays of Shakespeare, and some selections from Milton. The books for non-detailed study will as far as possible, be representative of narrative, descriptive, expository and persuasive composition.

N.B.—Alternative questions will be set at least to the extent of half the number of questions in each paper.

1. Poetry—

SHAKESPEARE : Othello and As You Like It

MILTON : Comus.

The following selections from Palgrave's Golden Treasury Part IV :—

WORDSWORTH : The Reaper ; Upon Westminster Bridge ; The Sky-lark ; Written in early Spring By the Sea ; London 1802 ; On the Extinction of of the Venetian Republic ; The World is Too Much With Us.

SHELLEY : Sky-lark . Written in the Euganean Hills ; Ode to the West Wind ; Stanzas written in Dejection.

KEATS : La Belle Dame Sans Merci : Ode to Autumn : Ode to the Grecian Urn.

The following selections from A Book of Verse from Longland to Kipling edited by J. C. Smith (Clarendon Press, Oxford.)

TENNYSON'S *Lotos-Eaters* and *Ulysses*, Browning's *Last Ride Together* and *My Last Duchess*, Matthew Arnold's *Thyrsis*, Sir William Watson's *Father of the Forest* and Francis Thomson's *Hound of Heaven*.

2. Prose:—

Selected Essays from Matthew Arnold edited by Rawlinson (Macmillan) omitting the essay on Pagan and Medieval Religious Sentiment)

Charles Lamb, Prose and Poetry edited by Gordon (Clarendon Press) omitting the poetical selections.]

Essays in Modern English, edited by Page and Rieu
pages 1-187 (Oxford University Press)

3. *Non-detailed Study:—*

STANLEY CASSON: Ancient Greece (Oxford University Press.)

HARDY: 'Return of the Native' (Macmillans' Indian edition).

A. C. BENSON: From a College Window (Nelson's Library.)

MORLEY: Select Essays Edited by Rawlinson (Macmillan.)

SIR CONAN DOYLE: Through the Magic Door (Nelson's Library)

HONOURS COURSE.

In addition to the papers of the Ordinary Course there will be a special paper of three hours, carrying 100 marks.

One of the following groups of books in addition to those prescribed for the Ordinary Course will form the subject of the examination

RALEIGH: Shakespeare (English Men of Letters of Series).

BRADLEY: Shakespearean Tragedy.

DOWDEN: Shakespeare's Mind and Art.

Or

Palgrave's Golden Treasury of Songs and Lyrics edited by C. B. Wheeler (Oxford University Press) Book IV and Additional Poems

NORMAN HEPPLE: Lyric Forms in English (Cambridge University Press).

EARNEST RHYS: English Lyric Poetry (Channels of English Literature.

EARNEST RHYS: A Century of English Essays (Everyman's Library.)

HUGH WALKER: English Essay and Essayists (Dent).

PEACOCK: English Prose, Parts IV and V (Oxford University Press.)

Sanskrit.

N.B.—Sanskrit shall be written in the Devanagari script.

ORDINARY COURSE.

There will be three papers, each of three hours' duration and each carrying 100 marks.

Paper I,—

- (a) Selections from the Veda : Rg Veda I 25, 154 : II 12 ; III 61 ; VII 49 ; X 121.
- (b) Kavyadarsa (omitting the chapter on शब्दालंकार ।
- (c) Kiratarjuniya Cantos I & II.

Paper II,—

- (a) Uttara Ramacharita.
- (b) Kadambari-Kathamukhaprakarana
- (c) Meghaduta

Paper III.—

- (a) History of Classical Sanskrit Literature.
Books recommended : (1) Macdonell's History of Sanskrit Literature (Chapter I & X to the end)
(2) Keith's Classical Sanskrit Literature and
(3) Keith's Sanskrit Drama Part II.
- (b) Unseen passages from Sanskrit for translation into English.
- (c) Translation from English into Sanskrit

HONOURS COURSE

In addition to the papers of Ordinary Course there will be a further paper of two hours' duration on the books noted below and a *viva voce* test based on the same :—

- (1) Kavya Prakasa, Chapters I and X.
- (2) Trakabhasa.

Or

Manusmriti—Chapters I to VII

Or

Bhagavadgita.

Pali.

There will be three papers each of three hours' duration and each carrying 100 marks.

Paper I.—

- (1) Dhammapada.
- (2) Dighanikaya Part I

Paper II.—

Anderson's Pali Reader.

Paper III.—

- (a) Unseen passages for translation from Pali into English.
- (b) Unseen passages for translation from English into Pali
- (c) Grammar.

Books recommended :—

E. Muller's Pali Grammar.

Kaccayana-Pali Grammar.

Composition in a Modern Indian Language.

There will be one paper on Composition in a Modern Indian Language, of three hours' duration and carrying 100 marks.

The paper shall consist of three essays, one general and two based on the subject-matter of the books recommended for study. The essays based on the books shall not demand a detailed knowledge of the contents of them.

N. B. Alternative subjects will be set for the essay at least to the extent of half the number.

The following books are recommended for general study as presenting models of composition and style:—

(A) HINDI.

- (1) *Mudra Raksasa* by Bharatendu Harishchandra (Khadgavilas Press).
2. *Hindi Nibandhamala* Part II
3. *Bharata Bharati* by Maithili Sarana Guptu
4. *Sahitya Sumana* by Bala Krishna Bhatta

(B) URDU

- 1 *As-i-Hayat* by Moulvi Mohammad Huzain Azad (Azad Book Depot, Lahore)

2. *Urdū-e-Mualla* by Ghalib
3. *Muqaddamaye-Shair-o-Shayari*

(C) **BENGALI**

1. *Karma-Katā* by Ramendra Sundar Trivedi.
2. *Nibhrīta-Chintā* by Kali Prasanna Ghosh.
3. *Prachīna-Sahitya* by Rabindra Nath Tagore.
4. *Kapala Kundala* by Bankim Chandra Chatterji.

(D) **ASSAMESE.**

Books recommended for study as presenting models of style :

(a) Selections from *Katha Bhagavat*. (Articles, *Shri Krishna Janma, Varsha and Sarat*) and *Bhātladewar Jivani* (Introduction to the *Katha Gita* edited by Hem Chandra Deb Goswami).

(b) Selections from *Janaki* (Article: *Samsara-Prabala*).

(c) *Manomati* by Rajanikanta Bardalui.

(d) *Belimur* (Drama) by Lakshminath Bezbarua.

(e) *Assamiya Bhasha ara Sahitya Bīranji* by Devenda Nath Bezbarua.

Books for reference :—

Ahom Assamese and English Dictionary by Gopal Chandra Barua (Govt. Book Depot, Shillong)

(E) **PARBATIA.**

Bhānuhbhaktiya Ramayana by Pandit Harihar.

Nepāl ka Itihāsa by Pandit Ambika Prasad Upadhyaya

(F) **PANJABI.**

Baba Nand Singh by Bhai Vir Singh.

Rana Surat Singh (1st four Chapters) by Bhai Vir Singh.

Khule Maidan by Sardar Puran Singh.

(G) **MARATHI.**

Nibandhamala by V. K. Chiplunkar. Nibandhas 1, 3, 4, 7, 8, 11, 13, 14, and 17.

Subhasita ani Vinoda by Kelkar.

Maratha ani Ingrej by Kelkar.

Sarada by Devala.

Bharabandhana by Garkari.

(H) GUJRATI.

Kavita ane Sahitya (Chapters 1, II, X, XI only) by Ramanbhai M. Nilkanth.

Uttara Rama Charita by Mani Lal N. Dhruva.

Sarasvati Chandra Part I by G. N. Tripathi.

Kavya Samuchchaya Part II published by the Gujrat Vidyapitha.

(I) SINDHI.

Purbi-Jot by Mr. Jethmal Parsram

Hindustan-Je Taurikh by Bulchand Kodhmal.

Gita-ji-Tar by Principal K. V. Thadhani.

Motian-ji-Dubli by Mirza Kelich Beg.

(H) TAMIL.

(i) *Cheran Tengutheran* by Vidvan M. Raghav Aiyangar Madura Tamil Sangham Press.

(ii) *Essays in Tamil*: Learning, Poetry, Friendship Health, Wealth, Prose by T. Chelvakesara Raya Mudaliar M. A. S. P. C. K. Press, Vepery.

(iii) *Amaladityan* by Rao Sahib P. Sambandam.

(iv) *Manimekalai* in prose, by Mr. V. Swaminatha Iyer (Ganesa Press, Madras.)

(I) TELUGU.

Siraji by K. V. Lakshman Rao, M. A.

Tikkana Samayaji by Virabhadra Row, Rajahmundry

Raja Niti Saramu by V. Suryanarayana Murti B A. B.L. (Perhampur.)

(J) MALAYALAM.

(i) *Marthandu Varma* by C. V. Raman Pillay, B. A., (B. V. Book Depot, Trivendrum).

(ii) *Kesari*—The Hon'ble Kunji Ramen Maynar, (Norman Printing Press, Calicut).

(iii) *Visha Vriksham* by T. C. Kalyani Amma, (Mangalodayam Press, Trichur)

(K) KANARESE.

(i) *Devan Ramyacharya's Life* by D.V. Gundappa, B.A.

(ii) *Visha Vri'sha* by B. Venkatachari.

(iii) *Santa* by Venkatesa Iyengar.

(D) ORIJA

Mahajatra Cantos 1—IV by Radhanath Ray.

Konarka by K. Misra.

Arabic and Persian.

ORDINARY COURSE.

There will be *three* papers, each of three hours' duration and each carrying 100 marks, the *first* on the text-books, grammar, rhetoric and prosody, the *second* on unseen translation from prose and verse and the *third* on translation from prose into the Classical Language.

The following text-books are prescribed:

(A) ARABIC.

ORDINARY COURSE.

Al-Fakhri.

Maqamat-i-Badr.

Saba-i-Mullaqa.

Devan-i-Hamasa (first Bab only)

HONOURS COURSE.

In addition to the papers of the Ordinary Course there will be a special paper of three hours carrying 100 marks.

Maqamat-i-Hariri (first half);

Nafhat-ul-Yaman

Tumurnama.

Q. ran (first three siparas).

(B) PERSIAN.

Prose:—

- (1) *Jang Namah* by Niamat Khan-i-Ali.
- (2) *Marde Khasis* edited by Qazi Fazle Haq.
Lahore.

Poetry:—

Naldaman-i-Faizi.

Hafiz (from radif of ω to the end)

For rapid reading:—

Chahar Muqala.

Sukhandan-e-Faras (whole) published by the Azad Book Depot, Lahore.

HONOURS COURSE.

In addition to the papers of the Ordinary Course there will be a special paper of three hours carrying 100 marks

Devan-i-Quam.

Qasaid-e-Urfi

Kulliyat-i-Sadi.

Sikandarnama of Nizami.

Shahnama of Firdausi (first half).

Modern European Languages.

(Course to be prescribed later on)

Philosophy.

N B —The books recommended for study are not meant to be used as prescribed text-books, but as indicating the general scope of studies in the subjects to which they relate. In Indian Philosophy, however, the questions should be confined, as far as possible, to the books recommended

ORDINARY COURSE.

There will be *three* papers, each of three hours' duration and each carrying 100 marks.

Paper I—Psychology

Books recommended for study.—

STOUT's Manual of Psychology—Third Edition. Revised and Enlarged (omitting Book II, Chapters IV—VII and Book IV, Chapter V).

N.B. Students will be required to show acquaintance with the Physiology of the Nervous System and of the Sense Organs, as far as necessary in connection with the study of Psychology, the books suggested for study being

HENRY: *Elementary Lessons in Physiology*—latest edition (Nervous and Sense Organs)

McDUGALL: *Physiological Psychology*

Books that may be consulted :-

STOUT: *Groundwork of Psychology*,

JAMES: *Text-book of Psychology*;

KULPE: *Outlines of Psychology*;

YERKES: *Introduction to Psychology*;

ANGELL: *Psychology*

Paper II—Ethics.

Recommended text-book

MACKENZIE: *Manual of Ethics* (latest edition)

Books that may be consulted :-

MUIRHEAD: *Elements of Ethics*;

A. C. MITTRA: *Elements of Morals*;

HYSLOP: *Elements of Ethics*;

SETH: *Ethical Principles*;

MILL: *Utilitarianism*;

SPENCER: *Data of Ethics*;

ROGER: *Short History of Ethics*.

Paper III Metaphysical Systems—European and Indian.

(1) FRASER'S *Selections from Berkely* (Fifth Edition—amended) Introduction and pp 1-166.

(2) *Sankhya Karika* with Gaudapada's (commentary).

N.B. In this paper 50 per cent of the total marks shall be assigned to Indian philosophy. Students will be required to show a general acquaintance with the outlines of philosophic thought, both European and Indian for which the following books are suggested for study --

ROGER: *History of Philosophy*

CUSHMAN: *Beginners' History of Philosophy*--Ancient and Modern

SRINIVASA IYENGAR: *Outlines of Hindu Philosophy*.

Books that may be consulted :—

WHILEY: *History of Philosophy*

FRASER: Berkeley (Blackwood's Philosophical Classics).

RUSSEL: Problems of Philosophy (Home University Library).

MAX MULLER: Six Systems of Indian Philosophy.

GARBE: Outlines of Indian Philosophy.

Sankhyatattva Kaumudi.

HONOURS COURSE.

Besides the papers mentioned above, candidates offering the Honours course will have to take up an advanced course in any *one* of the following subjects, on which one paper of three hours' duration and carrying 100 marks will be set.

(a) Logic

(b) History of Philosophy with special study of a particular author to be selected by the candidate.

(c) Social Psychology and Sociology.

(d) A branch of Indian Philosophy other than Sankhya such as:—

Nyaya-Vaisesika,

Vedanta (Advaita and Visistadvaita).

Jaina and Bauddha Philosophy.

(a) Logic:—

BAIN: Logic—Deductive and Inductive.

WELTON: Manual of Logic—Deductive (omitting Book IV Chapters III-VI) and Inductive.

CREIGHTON: Introductory Logic (Part III only)

Tarkabhāṣa of Kesava Misra.

N. B.—In this paper 33 per cent of the total marks shall be assigned to Indian Logic.

(b) History of Philosophy with special study of the position of a particular author.

FRANK THILLY: History of Philosophy and one of the following:—

Leibnitz: Monadology.

or

Descartes: Meditations.

or

Spinoza : Ethics.

(c) Social Psychology and Sociology.

Mc Dougall : Introduction to Social Psychology

Blackmar : Elements of Sociology.

Fairchild : Applied Sociology.

(d) Indian Philosophy :—

(1) Nyaya Vaisesika

(Books will be prescribed).

(2) Vedanta (Advaita and Visistadvaita)

(Books will be prescribed).

(3) Jain & Bauddha Philosophy.

The courses recommended for Jaina-Bauddha Philosophy are:—

Dravya Samgraha (Sacred Books of the Jainas series)
Dhammapada and Sutta-nipata.

Candidates will be required to show a general knowledge of the fundamental principles of Jainism and Buddhism. The following books are recommended for consultation :

Javeri : First Principles of Jainism.

Warren : Jainism.

Rhys David : Buddhism (American Lectures).

Mrs. Rhys David : Buddhistic Psychology.

Sogen : Systems of Buddhistic Thought.

(Calcutta University Publications).

Mathematics.

Ordinary Course.

There will be *three* papers, each of three hours' duration and each carrying 100 marks.

(i) The *first* paper will be on Algebra. Trigonometry and Analytical Geometry.

(ii) The *second* will be on Differential and Integral Calculus, and

(iii) The *third* will include Statics, Kinetics of a Particle and Hydrostatics.

FIRST PAPER.

Algebra.—Convergency and divergence of series. Simple continued fractions. Partial fractions. Easy inequalities. Determinant Elimination.

Trigonometry.—Inverse trigonometrical functions. De Moivre's theorem. Summation of trigonometrical series. Hyperbolic functions. Expansion of trigonometrical functions.

Analytical Geometry.—The straight line, circle, parabola, ellipse, hyperbola, and the general equation of the second degree, treated by means of rectangular, oblique and polar co-ordinates.

SECOND PAPER.

Differential calculus.—Differentiation. Successive differentiation. Development of functions. Indeterminate forms. Partial differential co-efficients. Maxima and minima for a single variable. Tangents and normals to curves. Asymptotes. Multiple points on curves. Envelopes. Convexity. Concavity. Points of inflexion. Radius of curvature. Evolutes. Curve tracing.

Integral Calculus.—General methods of integration. Standard forms. Integration by parts. Formulæ of reduction. Rectification of plane curves. Quadrature. Surfaces and volumes of solids of revolution.

THIRD PAPER.

Statics.—General conditions of equilibrium of a particle and of a rigid body under the action of forces in one plane. The principle of virtual work. Simple machines. Friction. Centres of gravity. Common catenary. Hook's Law.

Kinetics of a Particle.—Velocity and acceleration. Newton's Laws of Motion, Work and Energy Rectilinear Motion Projectiles in vacuum. Circular and Harmonic Motion. Simple and Cycloidal Pendulum. Impact.

Hydrostatics.—Fluid pressure. Pressure on immersed surfaces. Conditions of equilibrium of a floating body. Specific gravity. Properties of gases. Machines depending upon fluid pressure.

Books recommended:—

1. HALL AND KNIGHT: Higher Algebra.
2. LONEY: Trigonometry, Part II.
3. C. SMITH: Analytical Conics.
4. EDWARD: Differential Calculus for Beginners.
5. GANESH PRASAD: Differential Calculus.
6. " " : Integral Calculus.
7. LONEY: Treatise on Elementary Dynamics.
8. First three chapters of Williamson and Tarleton's Dynamics.
9. ROUTH OR MINCHIN: Statics Part I.
10. BESANT: Elementary Hydrostatics.

HONOURS COURSE.

In addition to the three papers of the ordinary course there will be a paper of three hours' duration (and carrying 100 marks) on an advanced course covering the undermentioned syllabus:—

Differential Equations—Standard forms of ordinary differential equations of the first order. Linear ordinary differential equations with constant co-efficients. Simple geometrical and dynamical applications.

Theory of Equations. Symmetric functions of roots. Transformation of equations. Descartes's Rule of signs. Equation of squared Difference of cubic. Reciprocal and Binomial Equations.

Astronomy—The Earth. Transit instrument. Meridian circle. Equatorial, Sextant and Micrometer. Atmospheric refraction. The sun and the solar system. Parallax. Determination of the First point of Aries. Precession. Notation. Aberration. The Moon. Lunar and solar eclipses. Measurement of time. Determination of latitude and longitude by simple methods.

Books recommended:—

G. Prasad's *Integral Calculus*. (Longmans, Green & Co.) pages 186-206.

D. N. Mallik's *Elementary Astronomy* (Cambridge University Press).

Edward's *Integral Calculus*.

Hall and Knight's *Higher Algebra*.

Political Economy and Political Philosophy.

There will be *three* papers as noted below, each of three hours' duration and each carrying 100 marks. A *fourth* paper of three hours and carrying 100 marks will be added for the Honours course.

*Ordinary Course.**Papers I and II—Principles of Economics :—*

Note.—Parts I and IV in the following syllabus will form Paper I and Parts II and III will form Paper II.

Part I :—CONSUMPTION, PRODUCTION, EXCHANGE AND DISTRIBUTION :—

Introductory :—Nature and Scope of Economics, Scope and Method of the Science.

Consumption :—Nature of Consumption, Wants, Conception of Utility and Value. Diminishing Utility, Consumer's Surplus, Elasticity of Demand. **Production :—**General conception, Factors of Production, Population, Organisation for Production, Business Cycles, Causes of Variation in Productive Power.

Exchange :—Demand and Supply, Market value and Normal value, Marginal Utility, Value of money, Value in relation to Production, Exchange, Distribution and consumption, Different Theories of Value, Monopoly Value.

Distribution :—Income, Distribution between individuals and classes, causes of variations in wages, profits, interest and rent.

Part II :—MONEY, BANKING AND EXCHANGE :—

Money :—Origin and Functions of money, Metallic Money, Monometalism and Bimetalism, Paper money, the Indian Currency system.

Banking :—Function of Banks, Banking Operations, Discount Rate. Regulation of Banking, Centralised and decentralised Banking, the Indian System of Banking, Prices and Value; Index numbers.

Exchange :—Foreign Exchanges, the Indian Exchange, Inland remittances, International Trade, Tariffs and Preferences.

Stock Exchange, Speculation, Commercial Fluctuations, Financial Crises.

Part III :—STATE INTERVENTION AND FINANCE :—

State Intervention :—State and the regulation of Industry, Factory Acts and Protection of the worker, Trade Union and the State, State Assistance to Agriculture and Industry, Public ownership and control, Socialism.

Finance :—Duties and expenses of the State, Budgets, Imperial, Provincial and Local Finance. Theories of Taxation, Incidence of Taxation. Methods of raising taxes, Loans and the Indian Debt.

*Note :—*The whole to be illustrated as far as possible by reference to past and present conditions of India.

Part IV :—INDIAN ECONOMIC ORGANISATION :—

Indian Economic Position, Natural Resources Stage of Development, Population, Poverty and Famines.

Social Structure, Economic influences of Family and Caste, Village economy, organisation for Agriculture and Industry, Land tenures and Land holdings. Agricultural Indebtedness, Co-operation, Irrigation, Railways and other forms of transportation.

Paper III —Political Science —

Part I :—ELEMENTS OF POLITICS :—

Scope and Method of the Science, Relation to other Sciences, the Theory of the State, Theories of the Origin of the State, Sovereignty of the State, Individual liberty, International relationships, Forms of the State, Separation of Powers, the Executive, the Legislature, the Electorates, Party System, the Judiciary, Federal system, Colonial Government, Local Government, the Functions of Government, Individualistic Theory, Socialistic Theory, the Modern State.

Part II :—THE BRITISH CONSTITUTION :—

The meaning of the Constitution. Classification of constitutions, salient features of the British constitution.

The Executive in England, the Crown, the Cabinet, the Civil Service.

The Legislature, the House of Lords, the House of Commons, Parliamentary Procedure, Party System in England, Franchise.

The Judiciary, Local Government, the State and the Empire :—Dominions, Colonies and Dependencies.

Part III :—THE INDIAN CONSTITUTION :—

Salient features of the Indian Constitution, Evolution of the constitution, Beginning of British control, Parliament and Indian Affairs, the Secretary of State and the India Council, Whitehall and the Government of India, the Viceroy and the Imperial Executive Council, the Government Secretariat. Functions of the Government of India. Relations with Provincial Governments, the Governors and other Heads of Provinces, Executive Councillors and Ministers, Sphere of Provincial Governments, History of the Legislatures, Morley-Minto Councils, the Reformed Councils, Relation of the Executive and the Legislature, the Indian and Provincial electorates. Communal Representation, Growth of Parties in the Constitution, Central and Provincial Finance, Local Self-government, Indian States and their place in the constitution.

The Indian Political Problem, Schemes of Reform and Development.

Books recommended :—

- (1) **MARSHALL**: Economics of Industry.
- (2) **CHAPMAN**: Outlines of Economics.
- (3) **GIDE**: Principles of Political Economy.
- (4) **WITHERS**: Meaning of Money.
- (5) **KEYNES**: Indian Currency and Finance.
- (6) **JEVONS**: Money, Banking and Exchange in India.
- (7) **ARMITAGE SMITH**: Principles and Methods of Taxation.
- (8) **MORRISON**: Industrial Organization of a Province.
- (9) **Imperial Gazetteer Vol. III.**
- (10) **KALE**: Indian Economics.
- (11) **LEACOCK**: Elements of Political Science.
- (12) **MARRIOT**: English Political Institutions.

- (13) **Montague-Chelmsford Report on Indian Constitutional Reforms.**
- (14) **BOSE: The Working Constitution of India.**

HONOURS COURSE.

Paper IV

In addition to the papers of the Ordinary Course there will be a special paper of three hours, carrying 100' marks on any *one* of the following subjects:—

1. **Economics and History of Economic Thought.**
2. **Money, Banking and International Trade.**
3. **Principles and Administration of Public Finance.**
4. **Political Ideas and History of Political Thought.**

BOOKS RECOMMENDED :

1. **Economics and History of Economic Thought.**
TAUSSIG: Principles of Economics.
FLUX: Principles of Economics.
HANEY: History of Economic Thought.
PRICE: Political Economy in England.
2. **Money, Banking and International Trade.**
ROBERTSON: Money.
AGGERS: Organised Banking.
GREGORY: Foreign Exchanges.
BASTABLE: Commerce of Nations.
.. International Trade.
SHIRRAS: Indian Currency, Banking and Finance:
Chamberlain Commission Report.
Babington Smith Committee Report.
Controller of Currency's Reports.
3. **Principles and Administration of Public Finance.**
PLEHN: Introduction to Public Finance.
ROBINSON: Public Finance.
HILTON YOUNG: System of National Finance.
COLLINS: National Budgetary System.
SHAH: Sixty years of Indian Finance.
Indian Budgets of the last five years.

4. Political Ideas and History of Political Thought.

POLLOCK : An Introduction to the History of Political Thought.

BURNS : Political Ideals.

Mc. IVOR BROWN : History of English Political Theories.

Do. Meaning of Democracy.

HEARNshaw : Democracy at the Crossways

FOLLET : The New State

History.

There will be THREE papers, each of three hours' duration and each carrying 100 marks. A fourth paper of three hours and carrying 100 marks will be added for the Honours Course.

ORDINARY COURSE.

Paper I.—

(Europe from 1453, with special reference to the 19th Century).

A. J. GRANT : History of Europe, new ed Part III only.

SEIGNOBOS : Contemporary Civilisation

LIPSON : Europe in the 19th Century.

Paper II.—

Either A (Ancient India).

V. A. SMITH : Early History of India.

RHYS DAVIDS : Buddhist India (Story of Nations).

SIR R. G. BHANDARKAR : A Peep into the Early History of India.

NOTE—Candidates will be expected to possess some knowledge of the original sources as set out in the text-books.

Or B. (Mediæval India).

LANE POOLE—Mediæval India under Muhammadan Rule.

„ „ Mediæval India from Contemporary Sources,
(Cooper & Co.)

V. A. SMITH : Akbar the Great Mughal.

RANADE : Rise of the Maratha Power, Vol. I.

Or C. (British India)

P. E. ROBERTS : the Historical Geography of India.

A. B. KEELGH : Speeches and Documents on Indian Policy 2 Vols.

NOTE Candidates will be expected to possess adequate information about the economic aspects of British Rule in India and for this purpose R C Dutt's books or similar works may be consulted as books of reference.

Paper III.—

(Political Science.)

C. D. BURNS : Political Ideals.

LEACOCK : Elements of Political Science.

G. D. H. COLE : Social Theory.

[The student is recommended to consult Seeley's Introduction to Political Science also.]

HONOURS COURSE.

Paper IV.

(General History of the World).

OSCAR BROWNING : General History of the World (Arnold).

V. A. RENOUF : Outlines of General History (Macmillan),

SEIGNOBOS : Ancient Civilization.

„ **Mediaeval and Modern Civilization.**



A Modern Indian Language and Literature.

HINDI.

ORDINARY COURSE.

There shall be three papers one on text-books of prose, the second on text-books of poetry and the third on translation from English into Hindi and Vice Versa and Composition.

Paper I Prose—

- (1) *Ramayana Katha* by Bhagavan Dasa Halna (Abhyudaya Press);

- (2) *Mulati Madhava* (Drama) by Satya Narayan Kaviratna ;
- (3) *Tulasidasa* by Ramachandra Shukla.
- (4) *Sahityalochana* by Shyam Sun'ar Das (Hindi Grantha-Ratnakara Series).

Paper II *Poetry*—

- (1) *Vinaya Pattrika* by Tulasi Dasa (Excluding *Stotras*).
- (2) *Padmavata* by Malika Muhammad Jayasi up to page 164 (N. P. Sabha edition).
- (3) *Rama Chandrika* by Keshava Dasa (abridged) (N. P. Sabha) up to page 178 verse 36 (N. P. Sabha edition).
- (4) *Rasa Batika* by Ganga Prasad Agnihotri.
- (5) *Sarala Pingala* by Puttana Lal Vidyarthi and Lakshmidhara Shukla.
- (6) *Shiva Baran and Chhatrasala Das'aka* by Bhushana.
- (7) *Bhasa Bhushana* by Jaswant Singh.
- (8) Greave's Sketch of Hindi Literature
- (9) M. P. Dvivedi's *Hindi Bhasa ki Utpatti*.

HONOURS COURSE.

There shall be an extra paper on a special author for students who wish to take Honours in a Modern Indian Language and Literature.

Works of any one of the following authors —
Jayasi, Behari, or Bharatendu Harishchandra.

The B. Sc. Examination.

REGULATIONS—CHAPTER XXXII.

1. The Examination for the degree of Bachelor of Science shall be held once a year at Benares, at such time and on such dates as the Syndicate may prescribe.

2. No candidate shall be admitted to the examination for the degree of Bachelor of Science, unless he has passed the Intermediate Examination of the University in the Faculty of Arts or of Science, or, in special cases, by per-

mission of the Syndicate, the Intermediate Examination of some other Indian University or the Board of High School and Intermediate Education established by Act of the Legislature, or the First Year Certificate Examination of the Mysore University and unless he has thereafter prosecuted a regular course of study for not less than two years in the University, or in a constituent College thereof.

3. (a) Notwithstanding any thing contained in Regulation 2, School-masters teaching in a recognised school, Demonstrators serving in the University or any of its constituent Colleges, may be admitted to the examination, by the special grace of the Senate, provided that by the date of the examination not less than two academical years shall have elapsed since the date of their passing the Intermediate Examination and that the period of continuous service shall have been not less 18 months

(b) Before a candidate is permitted by the special grace of the Senate to present himself in any Science subject, he shall produce a certificate from the Principal of a constituent College of the University, to the effect that he has completed the required course in the College Laboratory.

4. A candidate shall apply to the Registrar, in such form as the Syndicate may prescribe. His application and fee shall be despatched through the prescribed channel, so as to reach the Registrar at least four weeks before the commencement of the examination.

5. A candidate who has completed a regular course of study in the University or in a constituent college for the examination for the degree of Bachelor of Science but fails to pass or to appear may be admitted with the permission of the Syndicate to a subsequent examination for the same degree on a new application and on payment of a further fee. Such a candidate will not be required to prosecute a further course of study at the University or in a constituent college thereof.

6. The examination shall be conducted partly by means of papers and partly *visu voce*, and in subjects which admit of it, candidates shall also be required to undergo a practical examination.

7 Notwithstanding anything contained in this Chapter or in Chapter XXVI, a candidate who at his last appearance at the examination failed in one subject only

shall be admitted to a subsequent examination in that subject only and be declared to have passed the B. Sc. Examination on obtaining at least 40 per cent of the total marks in that subject.

8. A candidate who passes the examination in two or more stages according to the preceding Regulation shall not be classed or be eligible for any University awards connected with the examination.

9. The subjects of examination shall be the following—

Any one of the following groups:—

- (a) Physics, Chemistry, Mathematics.
- (b) Physics, Chemistry, Geology.
- (c) Chemistry, Botany, Zoology.
- (d) Chemistry, Botany, Geology.
- (e) Chemistry, Zoology, Geology.
- (f) Chemistry, Industrial Chemistry and General and Chemical Engineering.

provided that no candidate, be permitted to take group (a) (b) or (f) unless he has passed his Intermediate Examination with Mathematics and group (c), (d) or (e) unless he has passed his Intermediate Examination with Biology.

A candidate may also offer English, modern and practical, as an extra subject.

10. A candidate may obtain honours in any subject if he passes in the First Class in that subject as well as in a more advanced course in that subject prescribed for the purpose provided he obtains at least 45 per cent marks in the aggregate of the remaining subjects.

Syllabus and Text-Books (B.Sc.).

Physics.

ORDINARY COURSE.

The examination in Physics in the ordinary course shall consist of *two* papers, each of three hours' duration and each carrying 100 marks.

1 Paper.—General properties of Matter, Sound and Heat.

II Paper.—Light, Electricity and Magnetism.

There will also be a Practical Examination in Physics, to which 100 marks will be assigned.

The following syllabus is prescribed :—

GENERAL PROPERTIES OF MATTER.

Matter, Mass, Energy. Units and Dimensions. Use of Dimensional Equations. Kepler's Laws. Universal Gravitation-Cavendish and Boys' Experiment. Poyntings' Experiment. Motion of Rotation. Moment of Inertia. Angular Momentum. Kinetic Energy of Rotation. Fly-wheel Gyrostat. Simple Harmonic Motion. Elasticity. Young's Modulus. Rigidity Bulk Modulus. Surface Tension. Viscosity. High Vacuum Air-pumps and Vacuum Gauges.

SOUND.

Production and Propagation of Sound. Determination of Velocity of Sound and its connection with the Elasticity and Density of the Medium. Doppler's Principle. Reflection, Refraction and Interference of Sound. Beats. Stationary and Progressive Undulations. Methods of determining Frequency and Wave-lengths of Notes. Vibration of Strings and Columns of Air. The application of Fourier's Theorem to the Analysis of Complex Sounds. Experimental Methods of Analysing Complex Sounds. Lissajou's Figures. Structure of the Ear. Consonance and Dissonance. Application of the equation to simple problems in Interference.

HEAT.

Thermometry-High and Low Temperature Measurement Errors of a Mercurial Thermometer. Calorimetry. Specific Heat of Gases. Ice and Steam Calorimeters. Latent Heat. Vapour Pressures at different Temperatures. Hygrometry. Change of State. Andrew's Experiments and Continuity of State. Kinetic Theory of Gases. Van der Waal's Equation. Conductivity. Determinations of Coefficients of Conductivity. Radiation of Heat. Theory and Exchanges. Law of Cooling. Radiation Correction. The two laws of Thermodynamics. Heat Engine. Entropy. Absolute Scale of Temperature. Determination of Mechanical Equivalent of Heat.

LIGHT.

Mirrors and Lenses. Cardinal Points of Compound Lenses. Aplanatic Points. Spherical and Chromatic Aberrations. Achromatic Lenses. Ramsden's and Huygen's Eyepieces. Modern Photometers. Wave-Theory. Laws of Rectilinear Propagation. Reflection and Refraction. Interference. Biprism. Newton's Rings. Michelson's Interferometer. Diffraction in simple cases. Plane Diffraction Grating. Double Refraction of Uniaxal Crystals. Nicol Prism, Plane Circularly and Elliptically Polarised Light. Quarter-wave Plate. Interference of Polarised Light. Polarimeter Emission and Absorption Spectra. Infra-red and Ultra-Violet Radiations.

MAGNETISM.

Lines of Magnetic Force. Magnetic Potential. Action of one magnet on another, broadside or endways. Determination of Magnetic Moments. Horizontal component of Earth's Magnetic Force and the Dip. Magnetic Induction. Co-efficients of Magnetisation and Induction Permeability. Hysteresis, Diamagnetism.

ELECTRICITY.

Proof of the Law of Electric Repulsion Induction. Capacity. Dielectric Constant. Quadrant Electrometer. Gauss's Theorem. Lines and Tubes of Force. Energy of Electrostatic Field. Electromagnetism. Determination of Resistances. Conjugate system of Conductors. Determination of E. M. F. Potentiometer. Electrolysis and Electro-Chemical Equivalents. Joule's Law. Thermoelectric Currents. Mutual and Self Inductance. Ruhmkorff Induction Coil. Transformers.

Elementary Theory of Simple Dynamos and Alternators. Electric Motors. Alternating Currents, Choke Coil, Oscillatory Discharge of a Condenser, Hertzian Waves, Wireless Telegraphy and Telephony, Non-Mathematical Account of the Electro-Magnetic Theory of Light, Discharge of Electricity through Gases, Cathode rays and X-rays, Descriptive Account of Electron Theory, Elements of radio-activity and Radio-active Transformations.

The following books are suggested :—

Wagstaff : Properties of Matter.

Capstick : Sound.

Poynting and Thomson : Sound.

Poynting and Thomson : Heat.

Edser : Heat for Advanced students.

Edser : Light.

Hadley : Electricity and Magnetism.

Whetham : Experimental Electricity.

Watson : Text-book of Physics.

LIST OF EXPERIMENTS.

1. Sensibility of a Balance.
2. Determination of Young's Modulus of a Bar.
3. Determination of Young's Modulus of a Wire.
4. Rigidity—Statical.
5. Determination of Moments of Inertia.
6. Moment of Inertia of a Fly-Wheel.
7. Fortin's Barometer and Height by Aneroid Barometer.
8. Surface Tension of Water.
9. Viscosity of Water.
10. Pitch by Sonometer.
11. Pitch by Graphical Method.
12. n by Total Reflection.
13. Height by Sextant.
14. n by Convex Lens and Mirror
15. Chromatic Aberration of a Convex lens.
16. Focal Length of a Concave Lens.
17. Spectrometer—Angle and n of Prism
18. Spectrometer—Calibration and determination of Wave-length.
19. Spectrometer—Plane Grating.
20. Flicker Photometer—Candle-power of electric lamps at different voltages.
21. Newton's Rings.
22. Rotation of Plane of Polarisation.
23. Weight Thermometer
24. Constant Volume Air Thermometer.
25. Specific Heat by Cooling.
26. Ratio of the two Specific Heats of Air.
27. Conductivity of Copper.
28. Mechanical Equivalent of Heat.
29. Determination of H .
30. Magnetic Field due to a Straight Current.
31. Potentiometer.
32. Post Office Box. Resistance of Coil. Galvanometer and Battery.
33. Carey Foster's Bridge.
34. E. C. E. of Copper.
35. Determination of J .
36. Construction of Ammeter and Voltmeter.
37. Capacity of a condenser.
38. Thermo-electric Thermometer.

Book recommended for Practical work.--

Allen and Moore : Text-book of Practical Physics.

HONOURS COURSE.

There shall be an extra Theoretical Paper on "the Mathematical Theory of electricity and Magnetism and Elementary Electron Theory," of three hours duration and carrying 100 marks. The course will correspond roughly to J. J. Thomson's "Elements of Electricity and Magnetism."

Chemistry.

ORDINARY COURSE.

There will be two papers each of three hours' duration and two days' *practical* Examination. Each paper will carry 100 marks and there will be 100 marks for the practical examination.

INORGANIC CHEMISTRY.

The occurrence, preparation and properties of the elements and their more important compounds, excluding the rare elements, but including the following:—

Lithium, Platinum, Argon, Helium, Selenium, Tellurium, Molybdenum, Thallium, Titanium and Tungsten.

Radium and its more important properties.

ORGANIC CHEMISTRY.

General principles of Organic Chemistry, including qualitative and quantitative analysis.

Occurrence, preparation, general properties and constitutional formula of the following:—

Paraffin, its haloid derivatives, alcohols, ethers, aldehydes, ketones, fatty acids, the acid chlorides, anhydrides and amides, the esters, soaps, fats and saponification, hydrolysis.

Amines, cyanogen, hydrocyanic acid, nitriles and carbamines, potassium cyanide, ferro and ferricyanides, nitroparaffins.

Zinc ethyl and magnesium ethyl iodide.

The olefines and acetylenes.

Ethylene, glycol, glycerine, nitro-glycerine, carbohydrates, glucose, cane sugar, starch and cellulose, inversion of cane sugar—optical activity.

Lactic acid and the stereoisomerism of the lactic acids.

Aceto-acetic ester and its synthetic uses.

Carbonic acid, carbonyl chloride and urea.

Oxalic acid and the synthetic uses of the malonic ester

Tartaric acid and the stereoisomerism of tartaric acids and of the unsaturated dibasic acids.

Aromatic hydrocarbons; Kekule's theory; Armstrong's formula; orientation; nucleus and side chain compounds; benzene: toluene; common haloid derivatives of benzene and toluene; nitro and dinitro benzene.

Amino compounds—aniline and benzylamine, diazo reaction; diazo benzene chloride: azo and hydrozo benzene; benzene sulphonic acids; phenol; benzyl alcohol; benzaldehyde; acetophenone; benzophenone; benzoic acid; benzoic anhydride, benzamide, benzoyl chloride and benzoic esters.

Elementary discussion concerning naphthalene and anthracene

PHYSICAL CHEMISTRY.

Atomic and molecular hypothesis

Kinetic theory of gases; Van Der Waal's equation.

The periodic classification of elements. Electrolysis. The theory of electrolytic dissociation. Gaseous dissociation. Spectrum analysis. Elementary ideas of the different crystallographic systems. Osmotic pressure and theory of dilute solutions. The determination of the atomic and molecular weights. Boiling and freezing point methods. Theories of mass action, of catalysis, of indicators. Phase rule. Thermochemistry. Elementary ideas about radio activity. Avidity of acids and bases. Relation between the chemical properties and the physical constants.

Practical Chemistry.

1. Qualitative analysis of a mixture containing not more than four radicals (organic acids and bases excluded except acetic, oxalic and tartaric. Platinum and gold also excluded.)

2. Volumetric analysis.—Alkalimetry. Estimation of iron by Potassium permanganate and by potassium

bichromate. Oxalic acid by permanganate. Iodine by thiosulphate.

3. Gravimetric analysis. Analysis of a silver coin and estimation of iron, barium, aluminium, zinc, magnesium and calcium in their simple salts. Estimation of chlorides and sulphates.

4. Detection of carbon, hydrogen, nitrogen, sulphur, and chlorine in organic compounds. Determination of boiling and melting points. Fractional distillation. Distillation in steam.

5. Preparation of the following :—

Ethyl ether, ethyl iodide, acetaldehyde, acetone, acetamide, benzene, nitro-benzene, dinitro-benzene chloroform iodoform formic acid, diazo-benzene chloride, azo-benzene aniline, phenol.

Identification of the following :—

Acetic Acid, Formic Acid, Acetone, Ethyl Alcohol.

Benzene, Nitrobenzene, Acetaldehyde

Aniline and Glycerine.

Attention is directed to the importance of candidates keeping complete records of their practical work. When presenting themselves for the examination, they are required to submit their note-books containing records of their practical work performed during the two last years' training for inspection, by the examiner, *who will take them into account in deciding the examination*. Candidates are expected to be able to use logarithms in their calculations. During the practical examination, candidates are at liberty to consult any books of reference which they choose.

Books recommended :—

(Theoretical).

NEWTH: Inorganic Chemistry.

MELLOR: Modern Inorganic Chemistry.

ALEXANDER SMITH: General Inorganic Chemistry.

WALKER: Introduction to Physical Chemistry.

CAVEN AND LANDER: Systematic Inorganic Chemistry.

VAN DEVENTER: Physical Chemistry for Beginners.

COHEN: Theoretical Organic Chemistry.

PERKIN AND KIPPING: Organic Chemistry.

(*Practical*).

VELENTINE AND HODKINGSON: *Practical Chemistry*.

CLOWES: *Qualitative Analysis*.

CLOWES AND COLEMAN: *Quantitative Analysis*.

NEWTII: *Qualitative and Quantitative Analysis*.

COHEN: *Practical Organic Chemistry*.

Honours Course.

(Courses to be prescribed later on).

Mathematics.

(*Same as in B.A.*).

Geology.

ORDINARY COURSE.

There will be two papers each of three hours' duration and each carrying 100 marks. There will also be a practical examination carrying 100 marks.

Paper I—Dynamical, Structural and Historical Geology.

Paper II—Crystallography, Mineralogy, Petrology, Palæontology, Economic Geology.

The following Syllabus is prescribed :—

DYNAMICAL AND STRUCTURAL GEOLOGY.

The aims, methods, and applications of Geology.

Disintegration of the earth-crust by rain, wind, heat and cold, frost, underground water, rivers, glaciers, and the sea.

Transportation by gravity, rivers, glaciers, and wind.

Deposition of the detritus. Terrestrial, fluviatile, lacustrine, and marine deposits.

Volcanoes—form and structure, eruption and its products, causes of volcanic action.

Earthquakes—Nature and origin, the phenomenon and its effects. Connection with volcanoes.

Elevation and depression of land.

Evolution of surface-features by terrestrial agencies and river-erosion. Formation of valley-systems. The effects of glaciation and wind-action on topography.

Joints, bedding and lamination. Faults and folding. Contour maps. Outcrops of simple structures on contour-maps. Map-reading and the construction of sections.

HISTORICAL GEOLOGY.

Principles of stratigraphy. Sub-divisions of the geological record into groups, systems and series. The leading features and characteristic fossils of these sub-divisions. Important physical features of India. The rock-formations of India and Burma treated in a concise manner.

CRYSTALLOGRAPHY AND PHYSICAL PROPERTIES OF MINERALS

Crystallographic laws. The six systems of crystallography. Important groups of symmetry. Weiss and Miller systems of notation. The Contact Goniometer.

Twinning.

Density, hardness, and other physical properties of minerals. The petrological microscope.

Optical characters of minerals in the microscope under ordinary and polarized light.

MINERALOGY.

Study of about 40 of the important rock-forming minerals, with regard to their chemical composition, chemical alterations, crystallography, physical properties, microscopic characters, occurrence, and commercial uses if any.

Study of the important ore-forming minerals and others of economic importance with regard to their chemical composition, physical properties used in recognition, blowpipe tests, occurrence, and economic uses.

PETROLOGY.

Igneous rocks—morphology, texture, and classification. Macroscopic and microscopic characters of important rock-types and their mode of origin.

Sedimentary rocks—arenaceous, argillaceous, calcareous, and pyroclastic rocks.

Metamorphic rocks—thermal and dynamic metamorphism. Important types.

PALAEONTOLOGY.

Methods of preservation of fossils. The value of fossils as indices of age and climate. The detailed study of one or two type-specimens from the following fossil groups :—

Coelenterata Echinodermata, Trilobita, Brachiopoda, Lamellibranchia, Gasteropoda, Cephalopoda, Vertebrata, and fossil plants.

ECONOMIC GEOLOGY.

Forms and origin of ore-deposits. Magmatic, pneumatolytic, hydatogenetic, metasomatic, metamorphic and detrital deposits. The chief metallic ores and non-metallic minerals of economic importance found in India. Coal and petroleum: water and building stones.

General principles of prospecting and development. Economic considerations on which the value of an ore-deposit depends.

PRACTICAL WORK.

Determination of density, hardness and fusibility of minerals.

Reading and making drawings of crystals of common minerals.

Examination of important rock-forming minerals in hand specimens and under the microscope.

Microscopic and megascopic examination of a representative collection of rock-types and sections.

The study and drawing of specimens from a representative collection of fossils.

Blowpipe tests and hand-recognition of economic minerals. Easy exercises on the outcrop of beds. Reading geological maps and drawing sections across simple geological structures.

Text Books :—

"Introduction to Geology" by W. B. Scott (MacMillan) 1920.

"Manual of Mineralogy" by Dana and Ford (John Wiley) 1912.

"Minerals and the Microscope" by H. G. Smith (Thomas Murby) 1919.

"Handbook of Rocks" by J. F. Kemp (Van Nostrand) 1921 (Selected portions only).

"Outlines of Field Geology" by A. Geikie (Macmillan) 1912.

"Geology of Ore-Deposits" by Thomas & Mac Alister (Edward Arnold) 1920.

HONOURS COURSE.

There will be a special paper of three hours' duration and carrying 100 marks.

The subject of this paper which varies from year to year will be announced later.

Botany.**ORDINARY COURSE.**

There will be two papers, each of three hours' duration, and a practical test. There will be 100 marks for each paper, and 100 marks for the Practical Examination.

PAPER I.

Distinction between living and non-living matter: the distinctive properties of protoplasm: distinction between plants and animals.

A general outline of the study of the living plant with a view to understand the way in which it is constructed and the various life phenomena it exhibits, including:—

A. A knowledge of the external structure of its various parts (morphology):—

The Root, its modifications and its equivalents in the lower plants; the Stem, and its origin from simple thallus forms. The leaf: and its equivalents in the lower organisms, special adaptations of leaves and the origin of leaf structure from simple thalloid forms. The Inflorescence; the Flower and its modifications; the homology of the various parts of the flower, the origin and evolution of floral structure, its equivalents in the lower plants and the special advantages of floral structure. The ovule; Pollination and Fertilisation, self- and cross-pollination and the agencies, the post-fertilisation changes. The development of the Zygote and the Embryo. Fruits and Seeds and their dispersal. The morphological changes attendant upon germination.

B. A knowledge of the gross and minute internal structure of the plant body (Anatomy and Histology).

The cell, its contents, its methods of division; organisation of cell communities for co-ordination of functions by formation of Tissues and Tissue-systems.

The internal structure of the stem in the Vascular and the Non-vascular plants. Various kinds of Vascular construction e. g. Protostelic, Solenostelic, Dictyostelic, Monostelic, Schizostelic, and Plystelic, etc. and their sequence in evolution. Secondary growth in thickness. Structure of the Root in various groups of plant kingdom, its secondary growth in thickness, and the origin and evolution of Root structure. Structure of the Leaf and the origin and evolution of leaf structure, various types of construction of leaf structure e. g. Dorsiventral, Bilateral, Centric, Xerophytic, Hygrophytic etc.

Internal structure of the Reproductive organs; the changes that take place in the division of the reproductive cells. Fundamentals of Alternation of Generations; the internal structure of male and female gametophytes. The internal changes attendant upon fertilisation; the development of the Zygote and the germination of the Seedling.

C. A knowledge of the Functions carried on by the plant and of its energy relations, including a study of:—

- (1) The detailed physiology of the Cell; the general chemistry of the protoplasm and other Organic and Inorganic substances that are incorporated in the living plant as working units; distinctions between Colloids and Crystalloids and their special properties; principal types of chemical reactions in the plant body including enzymic

reactions which bring about a conversion of one substance into another. The general principles of physico-chemical equilibrium of vital reactions Liebig's "Law of Minimum" and Blackman's "Law of Limiting Factors"

- (ii) The gain of matter by the plant body ; the chemical substances required by the plant, their composition and sources of supply, the Soil and the Atmosphere. Processes of absorption by roots the absorption of gases by aerial organs, the mechanism of gaseous exchange in plants, the absorption by various other organs e. g. Haustoria, Water-absorbing Organs etc., Theory of Selective absorption and Antagonism of salts.
- (iii) The movement of substance in the plant body ; Root pressure ; movement of water and the transpiratory current ; cellular diffusion of gases and other substances and the part played by permeability ; the movement of organised substances in the plant body.
- (iv) Gain of potential energy by constructive processes of metabolism —The ultimate source of energy and the quantity absorbed by the plant for constructive purposes ; the process of CO_2 assimilation ; assimilation of heterotrophic plants such as Parasites, Saprophyte, and Carnivorous plants.
- (v) Conversion of potential energy into kinetic energy in destructive metabolism :—Respiratory processes in various organisms. e g. Sulphur Bacteria, Iron Bacteria Nitrite and Nitrate-Bacteria. Acetic acid Bacteria e't c., Respiration in higher plants ; anærobic respiration and alcoholic fermentation ; respiration of succulents, the energy liberated in respiration and the energy balance sheet of the plant.
- (vi) The waste products of destructive metabolism and the material balance sheet of the plants.
- (vii) The work done by the plant:—Growth : growth in length ; growth in other ways ; mechanism of differentiation and development ; irritability ; various forms of irritability, the mechanism of perception of stimulus ; conduction and response. Reproduction ; sexual and asexual, conditions favouring these ; physiology of reproduction

and the physiological nature of reproductive elements and hereditary units.

- (viii) **Organism as a whole and the Environment :—** Principles of harmony between the organism and the environment ; disturbance of equilibrium ; adjustment and adaptation ; plant communities.

D. Plant in its relation to space ; General principles of Geographical distribution.

E. Plant in its relation to Time : Evidences of Evolution Pre-Darwinian, Darwinian and post-Darwinian theories of Evolution and Origin of Species. Variation, Heredity and Mendelism and its applications

PAPER 2.

Classification of plants into main groups illustrated by a detailed study of the structure, functions and life-histories of the following in addition to those included in the Intermediate syllabus

A. Thallophyta—Nostoc or Oscillatoria.

- (i) **Algæ—**Chlamydomonas ; Volvox ; Pterococcus ; Vaucheria ; Coleochaete ; Oedogonium, Diatoms.
Ectocarpus ; Sargassum ; Fucus ; Dictyota.
Batrachospermum.
- (ii) **Fungi :—**
 - (a) **Phycomycetes:—**Pythium ; Saprolegnia.
 - (b) **Ascomycetes:—**Eurotium ; Humaria.
 - (c) **Basidiomycetes:—**Puccinia ; Agaricus.

B Bryophyta:—

- (i) **Hepaticæ:—**Marchantia ; Anthoceros
- (ii) **Musci:—**Sphagnum.

C Pteridophyta:—

- (i) **Equisetales:—**Equisetum.
- (ii) **Lycopodiales:—**Selaginella.
- (iii) **Filicales. Gleichenia. Marsilia.**

D Gymnosperms:—Pinus ; Gnetum.

Principles of classification of Angiosperms, illustrated by a general study of the following families:—

A. Monocotyledons:—Gramineæ; Palmæ; Aracæ; Liliacæ; Musacæ; Orchidacæ.

B. Dicotyledons:—Salicacæ; Moracæ; Chenopodiaceæ; Amarantaceæ; Ranunculacæ; Aconitaceæ; Papaveraceæ; Cruciferae; Rosacæ; Leguminosæ; Rutacæ; Meliacæ; Euphorbiacæ; Anacardiaceæ; Rhamnaceæ; Myrtacæ; Malvacæ; Umbelliferæ; Anacardiaceæ; Labiatæ; Solanacæ; Rubiacæ; Cucurbitacæ; Compositæ

PRACTICAL WORK.

The candidates shall be required (a) to examine and describe microscopic specimens, (b) to prepare and stain microscopic sections of plants and plant tissues, (c) to dissect and describe the plants and parts thereof, and (d) to refer the plants to their positions in the foregoing syllabus for classification.

They shall also be required to perform fundamental experiments in plant physiology.

A record of all the practical work done in the laboratory and the field must be produced at the time of the practical examination.

The following books are suggested.

STRASBURGER. Text-book of Botany.

STEVENS: Plant Anatomy.

HARDY—Introduction to Plant Geography

MARIE STOPES—Fossil Plants

COULTER, BARNES AND, COWLES—Text-Book of Botany
2 Vols

WILLIS—Flowering Plants and Ferns

LOCK—Variation, Heredity and Evolution

REYNOLDS GREEN—Plant Physiology

DARWIN AND ACTON—Practical Plant Physiology

KERNER AND OLIVER: Natural History of Plants.

SCOTT: Evolution of Plants

A. G. TANSLEY: Practical Plant Ecology.

FRITCH AND SALISBURY: An Introduction to the study of Plants.

An Introduction to the structure and Reproduction of Plants.

COULTER: Evolution of Sex in Plants.

HONOURS COURSE.

There will be a special paper of three hours' duration and carrying 100 marks.

The subject of the paper, which varies from year to year will be announced later.

Zoology.

(ORDINARY COURSE).

There will be *two* papers as noted below, each of three hours' duration. There will also be a practical test. Each paper will carry 100 marks and there will be 100 marks for the practical examination.

FIRST PAPER.

The structure and phenomena of the animal-cell treated in some detail. Parthenogenesis. Asexual and Sexual Reproduction. General Principles of Heredity, Variation and Evolution. Important features about Geographical and Geological Distribution.

The structure, habits, and development of the following groups, as illustrated by :—

PROTOZOA: Amœba, Paramœcium, Euglena. Monocystis and Malarial Parasite.

COELENTERATA: Hydra, Obelia, Aurelia, Alcyonium.

PLATYHELMINTHES: Liver-Fluke, Tœnia.

ANNULATA: Earthworm, Nereis and Leech.

ARTHROPODA: Prawn, Periplaneta, Anopheles, Scorpion and Scolopendra.

MOLLUSCA: Unio, and Pond Snail.

SECOND PAPER.

The structure, habits and development of the following groups as illustrated by :—

ACRANIA:

HEMICHORDATA: Balanoglossus.

URCCHORDATA: Ciona or other Ascidian.

CEPHALOCHORDATA: Amphioxus.

CRANIATA:

PISCES: Cyllium or other Elasmobranch.

AMPHIBIA: Frog.

REPTILIA: Calotes or Varanus.

AVES: Columba.

MAMMALIA: Echidna, Marsupial and Lepus.

The outlines of the developments of Amphioxus, Frog, Chick, and Rabbit.

PRACTICAL WORK.

Candidates will be required to show a thorough practical knowledge of anatomy and histology of the various types included in the foregoing syllabus.

Note-books containing a record of laboratory work must be produced at the practical examination.

Books recommended:—

PARKER AND HASWELL: Text-book of Zoology 2 vols.
(Macmillan)

THOMSON: Outlines of Zoology (Pentland).

MARSHALL AND HURST: Practical Zoology (Smith Elder).

WIEDERSHEIM: Comparative Anatomy of Vertebrates.

LOCK: Recent Progress in Heredity, Variation and Evolution

KINGLEY: Comparative Anatomy of Animals.

G. BOURNE: Comparative Anatomy of Animals.

GILCHRIST AND VON BONDE: Practical Zoology.

DENDY: Evolutionary Biology.

PARKER AND BHATIA: Text-book of Zoology for Indian Students

HONOURS COURSE

There will be an additional paper for the Honours examination of three hours' duration and carrying 100 marks. The paper will deal with the group Platyhelminthes.

The scope of the examination will correspond roughly to the following books:—

1. Lankester series Volume dealing with Platyhelminthes.

2. Cambridge Natural History series. Volume dealing with Plathelminthes
 3. Fantham, Stephens etc: Animal Parasites of Man
-

Industrial Chemistry.

There will be THREE papers, papers I and II carrying 75 marks each and paper III carrying 50 marks.

Articles mentioned under (a) 2, 3, 4, 6 and 9 will form the subject matter of paper I and those under (a) 1, 5, 7 and 8 will form the subject matter of paper II.

Paper III will pertain to the detailed study of one of the industries chosen by the candidates.

There will also be a practical examination to which 100 marks will be assigned. In allotting marks to the practical examination the practical Note-book and the samples prepared by the candidates will be taken into account.

The following syllabus is prescribed :—

(a) Amplification of the pure Chemistry course to include a theoretical knowledge of the raw materials used, their nature and sources and the methods of manufacture of the following :—

- (1) Ceramics (i.e., glass, pottery, porcelain, enamels and enamelling) and Cement.
- (2) Oils, soaps and candles; paints and varnishes.
- (3) Leather tanning and bye-products; Inks.
- (4) Sugars, Starches, Paper, Milk products
- (5) Matches, Pencils and Crayons.
- (6) Wood and Coal distillations; Industrial alcohol.
- (7) Electro-plating, Electrolytic and Electric furnace products.
- (8) Important mineral acids and heavy chemicals.
- (9) Dyeing and bleaching.

N B—A general theoretical knowledge would be given in the classes and wherever possible, demonstration tours would be arranged to visit factories to see the actual working conditions

(b) A detailed study of one of the Industries under clause (b) covering the whole ground of the

nature of the raw materials employed, the equipment and machinery required and a statement of the cost of production and sale prices and the probable market.

PRACTICAL WORK.

- (a) A knowledge of the principal manufacturing processes such as filtration, sublimation, distillation, crystallisation, evaporation, disintegration, calcination, etc.

List of appliances to be provided for demonstrating the above-mentioned processes :—

- (1) Filter Pumps and Filter Presses.
- (2) Centrifugals,
- (3) Stills for steam distillation,
- (4) Autoclaves to record a pressure of not less than 90 lbs.
- (5) Disintegrators and Sieves,
- (6) Ball-mill,
- (7) Rolling-mill,
- (8) Reverberatory Furnace.
- (9) Muffle-furnace.
- (10) Down-draft Kiln.
- (11) Glass Furnace.
- (12) Blower to be run by a motor,
- (13) Drums.
- (14) Vats,
- (15) Super-heated steam.

At least ten of the following to be done :—

1. Proximate Analysis of coal-moisture, volatile matter, fixed carbon, sulphur and ash.
2. Calorific Power of Coal by Thomson's Calorimeter.
3. Examination of Lubricating oil :—
 - (a) Viscosity.
 - (b) Flash point (i) open test (ii) closed test.
 - (c) Specific gravity.
 - (d) Free Acidity.
4. Saponification, Iodine and Acid values of fixed oils.

5. Testing Cement :—

- (a) Hydraulic Index of cement by Chemical Analysis.
- (b) Soundness.
- (c) Setting time.
- (d) Fineness.

6. Soap analysis—Free Alkali, Total Alkali, Total fatty acids and alcohol insoluble.

7. Assay of (a) tannin in extracts (b) commercial indigo,

8. Available Chlorine in Bleaching Powder and available Oxygen in Pyrolusite.

9. Free and total Sulphur Dioxide in Bisulphite Liquor.

10. Estimation of sugar.

11. Use of Soxhlet apparatus.

12. Water analysis—Temporary and Permanent Hardness, total solids, Chlorine and nitrites.

13. Fastness tests on dyed cloth.

14. Determination of nitrosity of Gay-Lussac Acid, Estimation of Nitrogen by various methods.

15. Estimation of alcohol in Alcohol mixtures, tinctures etc

(iii) The following books are recommended for study:—

1. A. F. ALLEN: Text-Book of Chemical Engineering.
2. OSCAR NAEGAL: Mechanical appliances used in Chemical and Metallurgical industries.
3. ROGERS: Manual of Industrial Chemistry.
4. THORPE: Outlines of Industrial Chemistry.

General and Chemical Engineering.

(1) MECHANICAL DRAWING AND APPLIED MECHANICS..

(a) *Mechanical Drawing* :—

An elementary course of lectures and drafting room exercises in simple machine parts; such as fastenings, bearings, engine details, etc.

Use of drawing instruments and material

Construction of Scales.

Simple Projection.

Construction and representation of screw.

Rivets, bolts, studs, nuts and set screws Keys and keyways, feathers. Flange, and muff couplings. Design of a cast iron flange for a shaft. Design of the flange, cover and studs for a small steam engine cylinder. Design for at least one type of stuffing box.

Design of simple rivetted lap and butt joints :—(a) for a tie bar (b) for a boiler.

Design of a simple bearing for a shaft.

Designs of pulleys, gearing, clutches, cams, and other machine elements used in the transmission of power Pipes and pipe joints. Engine details—a study of a few additional mechanisms selected from those ordinarily used in the Chemical Industry from a descriptive standpoint, and analysis of their motions

As large a number of examples as possible to be worked out and drawn to scale. The dimensions to be always calculated wherever possible and not merely copied.

Strength and nature of material used in machine construction.

Tracing and blue printing.

(b) *Applied Mechanics* :—

Forces—Resultant and Component Forces. Centre of Gravity. Moments of Forces. Practical applications of Forces and Moments. Bow's Notation applied to simple framed structures.

Work.—The principle of work and its application to machines; friction and efficiency. Friction and lubrication. Joule's equivalent. The inclined plane and screw.

Power.—Engines, pumps, brakes and electric motors. Transmission of motion and power by belts and spur-gearing

Materials.—The elastic law. Tension. Compression and Shearing. Bending and Twisting. Working stresses.

Factor of Safety.

Motion—Speed, Velocity, Acceleration, Momentum, Inertia and Force.

Energy—Mechanical, thermal and electrical energy and their relations.

Hydraulics—Press. Jack and Accumulator, Reciprocating pumps, Suction and delivery.

Text-book :—

Elementary Applied Mechanics by Morley and Inchley.

EXPERIMENTAL WORK

The laboratory work will, as far as possible, run parallel with the lecture courses and a number of experiments are arranged to illustrate the principles dealt with in the lectures.

(2) HEAT ENGINES AND POWER ENGINEERING.**(a) Heat Engines:—**

A general course dealing with the construction, operation and use of steam engines and boilers. The laboratory work should consist of tests of the simpler types.

(b) Power Engineering:—

Power production and its special application to the varied industries ; the sources of power ; the economic use of various fuels : production of power by the steam engine, the steam turbine, the internal combustion engine and the water turbine. Study of special and typical plants, both as to design, construction and economic operation. In the laboratory, tests will be made of the various types of prime movers, to determine their economic performance. Standard methods of reporting tests.

(3) SURVEYING AND PLOTTING.

Scales and systems and measurement connected with Surveying.

Conventional signs used when plotting. Areas, prisms, prismoids, and pyramids. Applications of Geometry and Trigonometry.

Enlarging and reducing maps. Plotting from field notes.

Plotting traverse by protractors; chords and rectangular co-ordinates.

The chain and methods of carrying out chain survey.

Ranging rods, offsets, cross-staff and optical square.

Prismatic compass. The plane table.

Levelling, use and adjustment of the Y-level. The Dumpy level and at least one other form of Spirit level.

Flying levels, Bench marks, check levelling, keeping the level-book.

Reduction and check of level-readings.

The Theodolite, its use in measuring angles, in azimuth and altitude. Open or closed transverse and railway curves

(4) BUILDING AND BUILDING MATERIALS

Timber—Characteristic properties and means of preservation of timber used in construction. Defects in timber and characteristics of good timber.

Wood Work—Joints used in wood work. Paints and Varnishes.

Bricks—Characteristics of good bricks. Standard size of bricks.

Brick Work—Bonds, English bonds, Damp proof courses, cornices.

Stone Work—Joints. Varieties of walling.

Limes, cements, mortars—Different kinds of sand mortar, lime and cement, preparation and mixing of mortars, strength of mortar, precautions in using.

Concrete—The matrix, the aggregate, the proportion of ingredients, mixing and laying, use of concrete, re-inforced concrete.

Building—Selection of site, foundations, preparation of foundation bed. Benching out breadth and form of foundation. Earth filling. Plinth. Thickness of wall

Openings and arches in wall. Fixing doors and window frame.

Floors—Bricks on edge, stone, patent-stone terrace.

Roofs—Trusses of wood and iron. Coverings. Terrace roofs.

Drawing—Of a simple building from measurement.

(5) ELECTRICAL ENGINEERING.

Explanation of terms:—Lines of force, Unit pole, Magnetic field and magnetic moment, circuit, generator, switch, ampere, ohm, volt, E. M. F. and P. D., Watt, Jor's, series circuit, parallel circuit.

Heating, chemical and magnetic effects of current, Joule's law, Ohm's law,

Dynamo Electric Machines—Physical principles and essential parts of both generators and motors.

Management of Electrical Machinery—Installation of generators. Electrical connections and operations of electrical motors. Elementary principles of alternate current machines. Running dynamos and alternators in series and in parallel.

Elements of Secondary Battery Engineering—Setting up a secondary battery, management of secondary battery its care and daily attendance.

Elements of Electric Lighting and power supply—including selection of the proper size of wires for a given number of lamps or of motors, testing and wiring and wiring electric fitting, fuses and safety devices, wiring rules and regulation, private installation work.

Description of galvanometers, ammeters, voltmeters and wattmeters.

Testing and Locating troubles in Electrical Machines and in the line.

There will be three papers each carrying 100 marks.

Paper I will deal with Heat Engines and Power Engineering.

Paper II will deal with Surveying and Plotting, Building materials and Electrical Engineering, and

Paper III will deal with Mechanical Drawing and Applied Mechanics.

English.

There will be a paper on General Composition of three hours duration, and carrying 100 marks and another on Special Composition of the same duration and carrying 100 marks bearing on books prescribed for general study, some of which will treat of scientific subjects.

Non detailed study—As in the B. A. but for Casson's *Ancient Greece* and A.C. Benson's "*From a Collection*" there will be substituted:—

R. A. Gregory ; *Discovery and the Spirit of Science* (Macmillan, Indian Edition), and

Thomson : *Introduction to Science* (Horn University Library).

APPENDIX.

The Previous Examination in Sanskrit.

(A) REGULATIONS—CHAPTER XXVIIA.

There shall be a Previous Examination in Sanskrit held at least twice a year, at such times and on such dates as the Syndicate may prescribe for such candidates as desire to take up one of the optional subjects prescribed in Group A (d) and (e) of Regulation 9 of Chapter XXVIII of the Regulations for the Intermediate Examination, or any of the optional subjects prescribed in Regulation 7 II (iv) of Chapter XXIX (Regulations for the B.A. Examination) in lieu of Sanskrit.

2. A candidate shall apply to the Registrar in such form as the Syndicate may prescribe. His application shall be despatched through the prescribed channel so as to reach the Registrar at least four weeks before the date of the examination.

3. A candidate who fails to pass, may be admitted to a subsequent examination, on a new application

4 The examination shall be conducted by means of one written paper only

5 The course prescribed for this examination shall cover some typical declensions and conjugations and simple *samāsas* and easy selections in prose and poetry

(B) COURSES

There will be only one paper of three hours' duration and carrying 100 marks.

Books prescribed :—

Selections from the Hitopadesa and the Nalopakhyaṇa
(University Book Depot).

In Sanskrit Grammar, students should acquaint themselves with typical declensions such as those of गण. मुनि. पितृ, लता. नदी, पत्र, मधु, and conjugation of roots like हस in लट्, लङ्, लोट् and लृट्, and also of कच्. वृत्त विशिष्ट. क, in लट् only and simple Samasas अन्वयीभावः, तन्पुरुष (including कर्मधारय, and द्विगु), इन्द्र and बहुव्रीहि, with examples.

मुद्रक—माधव विष्णु पराङ्कुर,
ज्ञानमण्डल यन्त्रालय, क.बा. चौरा, काशी ।

Benares Hindu University.



Prospectus of Studies

FOR

The M.A. & M.Sc. Examinations of 1927.

(Including (a) General Rules for Examinations
and (b) Special Regulations for the
Admission, Examination, etc. of
Women Students).

BENARES HINDU UNIVERSITY.

Prospectus of Studies for the M.A. & M.Sc. Examinations of 1927.

REGULATIONS—CHAPTER XXVI.

Examinations.

General Rules.

* * * *

2. All applications to appear in an examination shall be addressed to the Registrar, and shall be presented within such time and in such manner as may be prescribed by the Syndicate. Every such application shall be accompanied by a satisfactory character certificate from the head of the College or school to which the applicant belongs.

3. A candidate who fails to pass or who, from sickness or other cause, is unable to present himself for any examination, shall not receive a refund of his fee; but the Syndicate may, for sufficient cause, permit the candidate to present himself for the next ensuing examination, without payment of a further fee.

4. Except as provided in Regulation 3, a candidate, when admitted to one or more subsequent examinations or any part thereof, shall, before admission, pay the prescribed fee* for such examination, on each occasion when he is so admitted.

5. On receipt of the fee prescribed for the examination, the Registrar shall examine the application, which, if found to be in due form and in order, shall be registered in the register of candidates for such examination. The Registrar shall thereupon issue an admission card to the candidate, entitling him to sit for the said examination.

6. A candidate may not be admitted into the examination room, unless he produces to the officer conducting

*The fee prescribed for the M.A. & M.Sc. Examinations is Rs. 50/- only.

the examination, his admission card, or satisfies such officer that it will be subsequently produced.

7. A student shall be deemed to have pursued a regular course of study in a subject during a year or years, if he has attended at least seventy-five per cent of the course of lectures delivered in that subject during the year or years, and has produced a satisfactory character certificate from the Head of his College or School.

8. The Syndicate shall have power to condone any deficiency of attendance but only for cogent reasons.

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11. The term "year" in these Regulations means the term or terms of study or periods of study in the University or in one of its constituent Colleges, prescribed by the University, during a year of the Gregorian Calendar.

REGULATIONS—CHAPTER XV.

Admission of Women Students and Special Regulations governing their residence, examination, etc.

1. Women candidates shall be eligible for admission to the University and to its examinations, degrees and diplomas.

* * * * *

3. With the permission of the Syndicate, women candidates shall be eligible to appear at all examinations of the University (whether for admission or for a degree or a diploma) as private candidates.

4. It shall be open to the Syndicate to make arrangements for the examination of women candidates in *pardah*.

5. Women candidates shall not be compelled to appear in person before the President of the Convocation for their diplomas.

6. The Syndicate shall, from time to time, make such arrangements for the residence of women students as may be necessary.

7. In other respects, the conditions governing women candidates and students shall be those prescribed in these Regulations for male candidates

CHAPTER XXX

Regulations-Master of Arts.

1. The examination for the degree of Master of Arts shall be held once a year in Benares, at such time and on such dates as the Syndicate may prescribe.

2. The examination shall be open to candidates who have obtained the degree of B.A. or B.Sc. in this University or in special cases by permission of the Syndicate, some other Indian University established by Act of the Legislature, or the University of Mysore* and have, after obtaining that degree, completed a regular course of study for not less than two years in the University or in a constituent College.

3. A candidate shall apply to the Registrar in such form as the Syndicate may prescribe. His application and fee shall be despatched through the prescribed channel, so as to reach the Registrar at least four weeks before the commencement of the examination.

4. The examination shall be conducted by means of papers, and may also be *viva voce*.

5. A candidate may be examined in any one of the following subjects :

- (1) Samskrit
- (2) English.
- (3) Pali.
- (4) Any other Classical Language.
- (5) Philosophy.
- (6) History.

* Notwithstanding anything contained in these Regulations, a student, who is qualified under the foregoing Regulations for admission to the University, and who is a member of some other Indian University, shall not be admitted to the University or any constituent College thereof, without the production of —

(1) a leaving or transfer certificate signed by the Principal of his last College, and certifying to the satisfactory conduct of the student and mentioning the highest examination he has passed, and

(2) a certified copy of all the entries against his name in the Enrolment Register of his University if such a copy is obtainable.

A student of some other Indian University shall in any case be admitted only at the beginning of the particular course which he proposes to take in the University.

- (7) Political Economy and Political Philosophy.
- (8) Mathematics.
- (9) A Modern European Language.
- (10) Ancient Indian History and Culture.

6. Any Master of Arts may be admitted to the M.A. Examination in any branch other than that in which he was previously examined, without being required to prosecute a further course of study in the University, or in a constituent College thereof.

7. Failure to pass or appear at the Examination shall not disqualify the candidate for presenting himself at any subsequent examination on a new application being forwarded and a further fee paid. Such a candidate shall not be required to prosecute a further course of study in the University or in a constituent College.

Syllabus and Text-Books (M.A.).

Sanskrit.

There will be eight papers, each of three hours' duration and each carrying 100 marks. Of these five are compulsory and three are to be chosen from any of the groups at the option of the candidate. There will also be a *visa voce* Examination to which 100 marks will be assigned.

Compulsory :

Paper I

- (a) Rg. Veda Selections : I-25, I-154, II-12, V-83, VII-83, VII-86, X 14, X-90.
- (b) Aswalayana Grhyasutras
- (c) Macdonell's History of Sanskrit Literature.

Chaps. I—IX.

Paper II

- (a) Saddarsana Samuchchaya of Haribhadra
- (b) Sankhyakarika
- (c) Bhasaparichchheda
- (d) Jaimini Darsana from Madhava's Sarvadar-sana Sangraha.

Paper III

- (a) Sisupalavadha—Cantos I & II

- (b) Sakuntala
- (c) Kadambari—Purva bhaga
- (d) Siddhanta Kaumudi—Karaka, Samasa and Taddhita

Paper IV

- (a) Prakṛta Prakāśa
- (b) Bhandarkar's Wilson Philological Lectures II and III.
- (c) Karpura Manjari
- (d) Imperial Gazetteer Vol. II Ch I on Epigraphy.

Paper V

- Composition—(a) Translation from English into Samskrit.
 (b) Essay in Samskrit on a subject connected with the group which the candidate has selected.

In lieu of paper V (Composition) the candidate may offer a thesis connected with any of the subjects which he has read for his examination.

GROUP A,

Paper VI

- (a) Selections from Vedic Samhitas Rgveda mandala VII, Yajurveda Adh. 16; Atharvaveda I and II.
- (b) Aitareya Brahmana—Panchika VIII
- (c) Taittiriya Aranyaka—Prapathakas I III
- (d) Chhandogya Upanisad

Paper VII

- (a) Nirukta—Adhs. I and VII
- (b) Sayana's Introduction to his Rgveda Bhasya
- (c) Brihaddevata.

Paper VIII

- (a) Rk Pratisakhya
- (b) Vaidiki Prakriya (Siddhanta Kaumudi)
- (c) Macdonell's Vedic Grammar for Students
- (d) Bhandarkar's Wilson Philological Lectures.
- (e) Dr. Gune's Introduction to Comparative Philology.

GROUP B.

Paper VI Siddhanta Kaumudi of Bhattoji Diksita or
Astadhyayi with Kasika.

Paper VII Patanjali's Mahabhasya—Navanhika.

Paper VIII

- (a) Bhartrhari's Vakyapadiya
- (b) Vaiyakarana Bhusana Sara
- (c) Durghata—Vrtti.

GROUP C.

Paper VI

Saundarananda. Cantos I-VIII
Naisadha Charita—Cantos I-III
Dharmasarmabhyudaya—Cantos I-III
Harsacharita
Ramayana Champu
Gaudawaho Verses I-166.

Paper VII

Śvapna-Vasavadatta
Mrichchhakatika
Malatimadhava
Mudraraksasa
Venisamhara
Anargharaghava
Balaramayana
Prabodhachandrodaya.

Paper VIII

Kavyaprakasa
Dasarupaka with Dhanika's commentary
(omitting the illustrations)
Rasagangadhara—Ch. on Alamkara (from
उपमाजङ्कति to end)
Bharata's Natyasastra—Chs. I, II, III, IV
and V.

GROUP D.

Paper VI

- (a) Apastamba Dharmanasutras
- (b) Baudhayana „
- (c) Vasistha „

Paper VII

- (a) Manusmṛti with the commentaries of Medhatithi and Kulluka
- (b) Nārada Smṛti.

Paper VIII

- (a) Mitākṣara and Mayukha on Yājñavalkya's Vyavaharadhyaya
- (b) Jimutavahana's Dayabhaga
- (c) Viramitrodaya

GROUP E,

Paper VI

- (a) Taitirīya Saṃhita—Prapathaka I with Bhasya
- (b) Taitirīya Brahmana—Prapathaka I with Bhasya
- (c) Kātyāyana Śrauta Sūtras

Paper VII

- (a) Śabara Bhasya—Adh. I—III
- (b) Tantra Vartika—Adh. I
- (c) Jaiminiya Nyāyamala Vistara

Paper VIII

- (a) Prakaraṇa Panchika
- (b) Śāstra Dipika 3-12
- (c) Mīmāṃsa Nyāyaprakāśa of Apodeva

GROUP F.

Paper VI

- (a) Gautama Sūtras with Vātsyāyana Bhasya
- (b) Nyāya Vartika—I

Paper VII

- (a) Nyāyamanjari—ch. on Prameya
- (b) Kusumanjali with Haridāśi
- (c) Nyāyabindu
- (d) Pāṛikṣamukha sūtra

Paper VIII

- (a) Vaiśeṣika sūtras
- (b) Prasastapada Bhasya
- (c) Nyāya Muktavali

SYLLABUS AND TEXT-BOOKS—M.A.

GROUP G.

(SANKHYA-YOGA)

Paper VI

- (a) Kathopanisad with the Bhasya of Sankaracharya
- (b) Svetasvatara Upanisad with commentary
- (c) Bhagavadgita with the commentaries of Sankara and Ramanuja

Paper VII

- (a) Sankhya-tattva Kaumudi
- (b) Sankhya Sutras with Sankhya Pravachana Bhasya.

Paper VIII

- (a) Yoga Upanisads
- (b) Yogasutras of Patanjali with Vyasa bhasya and Vachaspati Misra's commentary.
- (c) Yogavartika

GROUP H.

Paper VI

- (a) Brihadaranyaka V—VIII
- (b) Chhandogya Upanisad with Sankara bhasya
- (c) Bhagavad Gita—with the commentaries of Sankara and Ramanuja
- (d) Mandukya Upanisad—Karika of Gaudapadacharya

Paper VII

- (a) Brahma Sutras with the Bhasya of Sankaracharya
- (b) Anubhasya I. I—3
- (c) Tattvatraya

OR

- (a) Brahma sutras with the Sri. Bhasya of Ramanujacharya
- (b) Anubhasya 1. 1—3
- (c) Sankaracharya's Dasasloki with Sidhanta-tattwabindu

OR

- (a) Brahmasutra with Anubhasya of Vallabhacharya

- (b) Tattvatraya
- (c) Sankaracharya's Dasasloki with Siddhanta Tattvabindu

Paper VIII

- (a) Panchadasi—Chs. VI—VIII
- (b) Vedanta Paribhasa
- (c) Siddhantalessa
- (d) Jivanmukti-viveka

GROUP I.

(J A I N I S M .)

Paper VI

- (a) Acharanga
- (b) Uttaradhyayana

Paper VII

- (a) Tattvarthadhigama Sutras with Bhasya
- (b) Rajavartika Adhyayas I & IV

Paper VIII

- (a) Dravyasangraha
- (b) Syadvadamanjari
- (c) Saptabhangi tarangini

GROUP J.

Epigraphy and Palaeography

- (a) Asoka Inscriptions
- (b) Buhler's Indian Palæography
- (c) Archæological Reports on Taksasila, Isipatana, Savatthi, Rajagṛha, Kusinara Bhita Nalanda, Pataliputra and Ahichakra

Paper VII

- (a) Hathigumpha Inscription of Kharavela
- (b) Inscriptions of the Satavahana Dynasty
- (c) Rapson's Ancient Indian Coins

Paper VIII

- (a) Gupta Inscriptions
- (b) Cunningham's Ancient Indian Geography with later identifications

English.

There will be *nine* papers for the M. A. Examination, each of three hours' duration and each carrying 100 marks. Two papers will be in Poetry, one in texts from Chaucer to the end of the 18th century and the other in texts of the 19th and 20th centuries. There will be two corresponding papers in Prose, and two in Drama, one on at least four representative plays of Shakespeare and the other on other specimens of English Dramatic Literature. There will also be a paper on representative specimens of English Criticism, and two others, one in the History of English Literature and the other in essay-writing, on an advanced literary subject. A knowledge of the History of English literature will be demanded of the student, not only in the special paper on the subject, but also on all the papers on text-books, and the examination in Shakespeare will include a general acquaintance with Shakespearian Art and Criticism. There will also be a *viva voce* examination carrying 100 marks and covering the entire course prescribed.

N.B. Alternative questions will be set at least to the extent of half the number of questions in each paper.

1. *Poetry—Part I*

CHAUCER: Prologue.

MILTON: *Paradise Lost* Books I-IV.

DRYDEN: *Medal and Mac Flecknoe* (Dryden's *Satires* edited by Churton Collins, Macmillan).

SPENSER: *Shepherd's Calendar*

2. *Poetry—Part II*

PALGRAVE: *Golden Treasury* Book IV (selections from Wordsworth, Byron, Shelley and Keats).

WARD: *English Poets* Vol. V (selections from Tennyson, Browning, Morris, Swinburne, Meredith, Francis Thomson and Rupert Brooke).

An Anthology of Modern Verse (Methuen).

Selections from Bridges, Hardy, Watson, Masfield Yeats.

3. *Prose—Part I.*

BACON: *Essays*.

English Essays: Selected by Peacock, Bacon to Goldsmith (Oxford University Press).

MILTON: *Allegoragica*

ADDISON: Selections from the Spectator (Edited by Lobban, Cambridge University Press).

FIELDING: Tom Jones.

AUSTEN: Sense and Sensibility.

4. *Prose—Part II.*

MACAULAY: Essay on Milton.

English Essays: Goldsmith to Stevenson, selected by Peacock (Oxford University Press).

Essays of To-day Edited by F. H. Prichard (Harrap).

RUSKIN: Seven Lamps of Architecture.

DICKENS: David Copperfield.

HARDY: Jude the Obscure.

5. *Drama—Part I, (Shakespeare).*

Antony and Cleopatra

King Henry IV—Part I.

King Lear.

The Tempest.

Books recommended :

SIR SIDNEY LEE: Life of Shakespeare.

SIR WALTER RALEIGH: Shakespeare.

DOWDEN: Shakespeare's Mind and Art.

BRADLEY: Shakesperean Tragedy.

MOULTON: Shakespeare as a Dramatic Artist.

6. *Drama—Part II*

BEN JOHNSON: Everyman in His Humour (Edited by Percy Simpson, Clarendon Press)

SHERIDAN: The Rivals.

SWINBURNE: Atalanta in Calydon.

BERNARD SHAW: St. Joan

Books recommended :—

SHELLING: English Drama (Dent's Channels of English Literature).

WARD: Dramatic Literature

7. *Criticism.*

SAINTSBURY: Loci Critici.

Books recommended :—

SAINTSBURY: History of English Criticism.

HUDSON: Introduction to the Study of Literature.

COURTHOPE: Life in Poetry and Law in Taste.

ARISTOTLE: Poetics translated by Butcher with commentary (Macmillan).

MOULTON: Modern Study of Literature (University of Chicago Press).

COLERIDGE: Biographia Literaria edited by George Sampson (Cambridge University Press).

8. *History of English Literature.*

Books recommended:—

SAINTSBURY: History of English Criticism.

LANG: History of English Literature.

For reference :

WARD. English Poets.

CRAIK: English Prose.

MORLEY: English Men of Letters Series.

HUDSON: Introduction to the Study of Literature (Harrap).

COWL: Theory of Poetry in England (Macmillan).

HEPPLF: Lyrical Forms in English (Cambridge University Press).

COURTHOPE: History of English Poetry.

CHAMBER'S Cyclopaedia of English Literature.

Cambridge History of English Literature.

• Oxford Book of English Verse.

PALGRAVE: Golden Treasury.

9 *Essay.*

Pali.

There will be eight papers, each of three hours' duration, and each carrying 100 marks. There will also be a *viva voce* examination carrying 100 marks.

Paper I—

Chapters I to XX from Mahavamsa.

Selections from the Jatakas. (as given in Dines Anderson's Pali Reader).

Paper II—

Dhammapada.

Padgalapannati, with Commentary

Paper III—

Milindapanha.

Dipavamsha.

Paper IV—

Composition.

Paper V—

Tharatherigatha, with Paramarthadipani by Dharmapala

Paper VI—

Selections from Chullavagga Chapters IV to VII and Mahavagga (Chapters I to V) and Lalitavistara. (Chapters I to XV).

Paper VII—

Digghanikaya, Vol. I.

Bodhicharyavatara, with Commentary (Ch. IX only):

Paper VIII—

Kachchayana's Grammar.

History of Buddhist Literature.

Arabic and Persian.

There will be seven papers each of three hours' duration and each carrying 100 marks.

(i) Prose Text-books.

(ii) Poetry Text-books.

(iii) Unseen Prose and Verse Translation, and

(iv) Translation into the Language.

(v) Essay in the Classical Language on some Literary subject.

(vi) The History of the Language and the Literature.

N.B.—Questions to be answered in English or Urdu or Hindi.

(vii) The special selected subject.

(A) ARABIC.

Maqamat-i-Hariri (whole).*Diwan-i-Hamasa* (whole).*Diwan-i-Mutanabbi*.

Travels of Ibn-i-Batuta

Faruzdaq (first half).

Recommended for study :—

Nicholson's Literary History of the Arabs (Fisher Unwin).

Special subject to be chosen from the following:—

- (i) Arabic History and Geography.
- (ii) Arabic Logic and Philosophy.
- (iii) The Quran and Quaranic Exegesis.
- (iv) Modern Egyptian Arabic as exhibited in Green's Grammar and Selections. (Oxford Clarendon Press).
- (v) Semetic Philology with special reference to Wright's Comparative Semetic Grammar (Cambridge University Press).

(B) PERSIAN.

Waqai-i-Ni'mat Khan.*Akhlaq-i-Jalali*.

Letters of Abul Fazl.

Diwan-i-Saib.*Qasaid-i-Anwari**Shahnama of Firdausi*.*Tazkirat-ush-Shu'ara* of Daulat Shah.

Recommended for study:—

Browne's Literary History of India (Fisher Unwin).

Shi'r-ul' Ajam by Shibli. (Dar-ul-musannifin, Azamgarh).

Special subject to be chosen from the following;—

- (i) Old Persian Inscriptions as given in Tolman's book. (American Book Company),
- (ii) Avesta Grammar and Selections from the Avesta, published by A. V. Williams Jackson.

- (iii) The differences between modern and classical Persian, as shown in Roger's *Persian Plays*, the *Vazir-i-Lankaran*, and Phillott's *Modern Persian Stories* (Asiatic Society of Bengal.)
- (iv) Persian Philology with special reference to Grey's Indo-Iranian Philology. (Columbia University Press).

Philosophy.

There will be seven papers, each of three hours' duration and each carrying 100 marks. Of these, Papers I, II, III, IV and VII are common and compulsory for all candidates. Papers V and VI will be either on a branch of European or of Indian Philosophy and a candidate will have to select for the two papers a subject under either head, as indicated below under Group A and Group B. There will also be a *viva voce* examination carrying 100 marks.

N. B.—The books recommended for study are not meant to be used as prescribed text-books but as indicating the general scope of studies in the subjects to which they relate. In Indian Philosophy, however, the questions should be confined as far as possible, to the books recommended.

Paper 1—History of European Philosophy—Ancient, Mediæval and Modern with special reference to Kant's "Position in Philosophy" as presented in his *Critique of Pure Reason*.

Books recommended for study :—

- (1) ZELLER : Outlines of the History of Greek Philosophy.
- (2) TURNER : History of Philosophy (Mediæval Period).
- (3) FLACKENBERG : History of Modern Philosophy.
- (4) WATSON : Selections from Kant.

Books that may be consulted :—

ZELLER : Plato and Aristotle (Longmans).

ADAMSON : Developments of Greek Philosophy.

WEBER : History of Philosophy.

DE WULF : History of Mediæval Philosophy (English Translation).

WANDELBAND: History of Philosophy.

ADAMSON: Development of Modern Philosophy.

WATSON: Philosophy of Kant Explained.

WARD: A Study of Kant (Cambridge University Press)

KANT: Prolegomena to Metaphysics (English Translation by Mahaffy).

Paper II—Outlines of Indian Philosophy.

Books recommended for study :—

- (1) Saddarsana Samuchchaya of Haribhadra
- (2) Sariraka Bhasya Adhyaya II, Padas I and II
- (3) Vedantasara of Sadananda

Books that may be consulted :

Commentary of Gunaratna on Saddarsana Samuchchaya Sarvadarsana Sangraha.

DAS GUPTA: History of Indian Philosophy (Cambridge University Press).

RADHA KRISHNAN: Indian Philosophy (George Allen and Company)

DEUSSEN: System of the Vedanta

Paper III—General Psychology.

Books recommended for study—

- (1) **JAMES**: Principles of Psychology
- (2) **STOUT**: Analytic Psychology
- (3) **WARD**: Psychological Principles.

Books that may be consulted :

MOORE: Foundations of Psychology (Princeton University Press).

KULPE: Outlines of Psychology.

Mc DOUGALL: Outlines of Psychology (Methuen and Scribners).

SULLY: Human Mind.

ANGELL: Chapters from Modern Psychology

BALDWIN: History of Psychology.

KLEMM: History of Psychology (English Translation Scribners).

Paper IV—General Philosophy.**Books recommended for study :—**

- (1) TAYLOR : Elements of Metaphysics.
- (2) HOFFDING : Problems of Philosophy.
- (3) BERGSON : Introduction to Metaphysics.
- (4) KULPE : Introduction to Philosophy.
- (5) PERRY : Present Philosophical Tendencies.
- (6) JOACHIM : The Nature of Truth.

Books that may be consulted :—

JAMES : Meaning of Truth.

BOSANQUET : The Meeting of Extremes in Contemporary Philosophy.

ESSAYS IN NEO-Realism

ESSAYS IN Critical Realism.

SCHILLER : Studies in Humanism.

STURT : Personal Idealism.

PAULSEN : Introduction to Philosophy.

Papers V and VI—**GROUP A.**

Special Study of one of the following subjects :—

- (a) Psychology (special).
- (b) Logic
- (c) Ethics and Sociology
- (d) Comparative Religion.

Paper V—Psychology, Physiological and Abnormal,**Books recommended for study :—**

- (1) ZIEHEN: Introduction to Physiological Psychology
- (2) WUNDT : Principles of Physiological Psychology,
Vol. 1 (translated by E. B. Titchener).
- (3) MERCIER : Psychology—Normal and Morbid.
- (4) MYERS: Human Personality.

Books that may be consulted :—

LADD: Physiological Psychology.

CORIAT: Abnormal Psychology (2nd edition).

SIDIS: The Foundations of Normal and Abnormal Psychology.

SIDIS AND GOODHART: Multiple Personality

JASTROW: The Subconscious.

FREUD: Introductory Lectures on Psycho-Analysis
(George Allen).

N.B.—Comparative Study of Western and Indian Psychology will be required.

Paper VI—

Psychology—Comparative, Social and Religious.

Books recommended for study :—

- (1) **LLOYD MORGAN: Comparative Psychology.**
- (2) **HOBHOUSE: Mind in Evolution.**
- (3) **Mc DOUGALL: Introduction to Social Psychology.**
(18th edition).
- (4) **PRATT: The Religious Consciousness.** (The Macmillan Company, New York).

Books that may be consulted :—

WASHBURN: The Animal Mind.

WATSON: Behaviour: An Introduction to Comparative Psychology (Henry Holt, New York).

ROSS: Social Psychology.

MAC DOUGALL: The Group Mind.

JAMES: Varieties of Religious Experience.

WATSON: Interpretation of Religious Experience
(Gifford Lectures).

(b) **Logic.**

Paper V—

Logic—Formal and Symbolic.

Books recommended for study :—

- (1) **KEYNE: Formal Logic** (Fourth edition).
- (2) **HUGH MACCOLL: Symbolic Logic.**
- (3) **SCHILLER: Formal Logic.**

Books that may be consulted :—

DEWEY: Studies in Logical Theory.

JEVONS: Pure Logic and other Essays.

JOHNSTON: Logic.

VENN: Symbolic Logic.

Paper VI—

Logic as Theory of Knowledge and Methodology.

Books recommended for study :—

- (1) HOBHOUSE: Theory of Knowledge.
- (2) BOSANQUET: Essentials of Logic.
- (3) VENN: Empirical Logic.
- (4) ADAMSON: History of Logic.

Books that may be consulted :—

MILL: System of Logic.

JEVONS: Principles of Science.

SIGSWART: Logic.

BRADLEY: Principles of Logic.

BOSANQUET: Logic or Morphology of Thought.

B. N. SEAL: Positive Sciences of the Hindus Ch. VII.

N.B.—Comparative study of Western and Indian Logic will be required.

(c) Ethics and Sociology.

Paper V—

Ethics.

Books recommended for study :—

- (1) GREEN: Prolegomena to Ethics.
- (2) WUNDT: Ethical Systems,
- (3) ALEXANDER: Moral Order and Progress.
- (4) MOORE: Principia Ethica (2nd Edition).

Books that may be consulted :—

ARISTOTLE: Nichomachean Ethics.

ROYCE: Philosophy of Loyalty.

KANT: Theory of Ethics (Abbot).

SORLEY: Recent Tendencies in Ethics.

MARTINEAU: Types of Ethical Theory.

LESLIE STEPHEN: Science of Ethics

WILLIAMS: Evolutional Ethics.

TAYLOR: Problem of Conduct.

SIDGWICK: History of Ethics.

Paper VI—

Sociology.

Books recommended for study :—

- (1) DEALEY: Sociology—Its Development and Application (Appleton).

(2) GIDDINGS: Principles of Sociology.

(3) SMALL: General Sociology (The Chicago University Press).

Books that may be consulted :—

SPENCER: Principles of Sociology.

PARK AND BURGESS: An Introduction to the Science of Sociology (The Chicago University Press).

Mc DOUGALL : The Group Mind.

TYLOR: Primitive Culture.

WARD: Dynamic Sociology.

WESTERMARCH: History of Moral Ideas.

N.B.—Comparative study of Western and Indian Ethics and Sociology will be required.

(d) Comparative Religion.

(Books to be prescribed later on).

GROUP B.

Special study of any one of the following subjects :—

(a) Nyaya Vaisesika (b) Sankhya Yoga (c) Vedanta (Advaita and Visistadvaita) (d) Mimamsa (e) Jaina-Bauddha Philosophy.

(a) NYAYA AND VAISESIKA.

Paper V—

Gautama Sutras with Vishwanath Vritti.

Paper VI—

Kanada Sutras with Upaskara or Prasastapada.

Books that may be consulted :—

Vatsyayana Bhasya on the Gautama Sutras.

Kanada Sutras and Vritti of Jayanarayana.

Chandrakantiya Bhashya on Kanada Sutras:

J. C. CHATTERJI: Hindu Realism:

B. N. SEAL: Positive Science of the Hindus.
Chapter VII.

Nyaya Kandali.

(b) SANKHYA YOGA.

Paper V—

Sankhya Philosophy.

Kapila Sutras with Aniruddha Vritti and Tattwa Kaumudi.

Paper VI—

Yoga Philosophy.

Patanjala Sutras with Vyasa Bhasya and the Vritti called Maniprabha.

Books that may be consulted :—

VIJNANABHIKSHU'S Commentary on the Kapila Sutras and Yogavartika.

Tattwasamasa Sutras.

Srimad Bhagvatam (portions bearing on the subjects here).

Yogavasistham.

VACHASPATI MISRA'S Vaisaradi on the Vyasa Bhasya.

(c) **VEDANTA.**

Paper V—

Advaita Vedanta.

Panchadasi (the whole) ; Brahma Sutras with Sankara Bhasya (Sutras 1-4).

Paper VI—Visistadvaita Vedanta.

Ramanuja Bhasya (the entire commentary under Sutras 1-4).

Lokacharya : Tattwattraya (Chowkhamba Sanskrit Series).

Books that may be consulted :—

Vedantapariibhasa.

Siddhantalessa.

DEUSSEN : Philosophy of the Upanisads.

Vedartha Samgraha of Ramanuja.

DEUSSEN : System of the Vedanta.

(d) **MIMAMSA.**

(Courses not prescribed as yet).

(e) **JAINA-BAUDDHA PHILOSOPHY:**

Paper V—

Jaina Philosophy.

Books recommended for study :—

Tattvarthadhigama Sutra with the commentary of Umasvati Vachaka (Raichandra Jainashastramala Series,

Bombay); Syadvada Manjari of Mallisena (Choukhamba Samskrit Series).

Paper VI—

Bauddha Philosophy.

Books recommended for study :—

Abhidhammatha Samgraha and Samyutta Nikaya-
Nidana Vagga

Paper VII—

Essay.

N B - - Alternative questions (one of which will have to be attempted) are to be set on the subjects of special study offered by the candidate

History.

There will be seven papers each of three hours' duration and each carrying 100 marks. No exchange of papers between Groups A, B and C is allowed.

Paper I—

Comparative Politics.

WARDE FOWLER: City State of the Greeks and Romans.

GUIZOT: Lectures on Civilization in Europe.

SIDGWICK: Development of European Polity.

LOWELL: Governments and Parties in Continental Europe.

BRYCE: Modern Democracies.

Paper II—

"Napoleon."

H. ROSE: Napoleon.

FOURNIER: Napoleon.

FISHER: { Bonapartism.
 { Napoleonic Statesmanship in Germany.

BEARDSLEY: Napoleon-Fall.

MORSE STEPHEN: Revolutionary Europe.

LORD ACTON: Lectures on the French Revolution.

Cambridge Modern History.

Paper III—

The Constitutional History of England.

DICEY: Law of the Constitution.

ADAM: English Constitutional History.

MAITLAND: English Constitutional History

Paper IV—

An essay on any subject included in the course.

Papers V—VII—

A Group.

(i)—(Ancient Hindu India).

BROWN: Indian Coins.

BANERJI: Public Administration in Ancient India.

SCHOFF: Periples.

C. V. VAIDYA: Epic India.

MC. CRINDLE: Megasthenes and Arian.

The Cambridge History of India Vol. I.

KAEGI: *Rg. Veda*.

FLEET: Gupta Inscriptions (Corpus Inscript. Indic
Vol. III).

[The student is expected to possess an up-to-date knowledge of the Ancient Geography of India].

(ii)—(The Buddhistic World).

The Cambridge History of India Vol. I.

D. R. BHANDARKAR: Carmichael Lectures on Ancient
Indian History 1918.

BUHLER: Indian Sect of Jainas,

RHYS DAVIDS: American Lectures on Buddhism.

WALTERS: Yuan Chwang.

LEGGE: Fa Hian.

Asoka's inscriptions as in Epigraphia Indica Vol. II.

GILES: Civilisation of China (Home University).

TAKAKASU: Itsing and others.

(iii)—(The Ancient East).

HUTTON WEBSTER: A History of the Ancient World.

RAWLINSON: India and the Western World.

G. N. BANERJI: Hellenism in Ancient India.

G. N. BANERJI: India as known to the Ancient World.

B. K. SARKAR: Chinese Religion through Hindu Eyes,

R. K. MUKERJI : History of Indian Shipping and Maritime Enterprise.

GILBERT SLATER : The Dravidian Element in Indian Culture.

KRISHNASWAMY IYENGAR ; Some Contributions of South India to Indian Culture.

Select Articles from the J. R. A. S and other Journals.

Papers V—VII.

B. GROUP.

(i)—(Mediæval India)

ELLIOT AND DOWSON : Vols. 2-4.

J. N. SARKAR : History of Aurangzeb.

TOD : Rajasthan, Vol. I. (Sketch of the Feudal System and Annals of Mewar).

V. A. SMITH : Akbar the Great Mughal.

HAIG : Historic Landmarks of the Deccan (Pioneer Press).

GRANT DUFF : History of the Mahrattas, Vols. I and II Chapters 1-7 (or to the death of Madhav Rao 1772).

(ii)—(The Islamic World outside India)

MUIR : The Caliphate, new ed. by Weir.

Cambridge Mediæval History Vol. II Chs. 10-12.

LANE POOLE : History of Egypt under the Arabs.
(Methuen),

„ Moors in Spain (Story of Nations).

ARNOLD : Lectures on the Caliphate.

VON KREMER : Orient under the Caliphs

(iii)—(Mediæval Europe)

Cambridge Mediæval History, Vols. 1-3

BRYCE : Holy Roman Empire.

BEMONT AND MONOD : History of the Middle Ages.

E. JENKS : Law and Politics in the Middle Ages
(Murray).

SEIGNBOS : Mediæval Civilisation.

Papers V—VII. C. Group.

(i).—The Beginnings of the British connection with India.

W. W. HUNTER: History of British India 2 Vols.

RAMSAY MUIR: The Making of British India

B. D. BASU: Rise of the Christian Power in India Vol. I

DODSWELL: Clive and Dupleix.

MALLESON: The French in India.

G. W. FORREST: Clive 2 Vols.

The following books should be consulted as books of reference:—

FORREST: English Factories in India.

: Letters Received by the E. I. Co.

SAINTSBURY: Calendar of the E. I. Co., Indian Record.

(ii)—The consolidation of British Rule in India 1810-1858.

The Journals of Marquis of Hastings.

LEE WARNER: The Marquis of Dalhousie 2 Vols.

BAIRD: Private Letters of the Marquis of Dalhousie.

LYALL: The Rise of British Dominion in India.

CUNNINGHAM: History of the Sikhs.

MILL AND WILSON: History of India Vols, VII-IX.

ANDERSON AND SUBHEDAR: The Expansion of British India (1818-1858, Bell).

Books of Reference:—

MALCOLM: Central India Vol. II.

Political History of India Appendix to Vol. II.

GRANT DUFF: History of Marhattas Vol. III.

MARSHMAN: History of India.

(And other books to be announced later).

(iii)—India under the Crown, Political, Constitutional and Economic Aspects.

PRITCHARD: Administration of India 1856-1868.

LADY BETTY BALFOUR: Lord Lytton's Indian Administration.

BLUNT: India under Ripon.

FRAZER: India under Curzon and After.

A. C. MAZUMDAR: Indian National Evolution.

P. MUKHARJEE: Indian Constitutional Documents.

ILBERT: Historical Introduction.

MORLEY : Recollections Vol. II.

R. C. DUTT : Economic History of British India 2 Vols.

GOKHALEY'S SPEECHES.

MONTAGUE-CHELMSFORD REPORT.

Books of Reference:—

Report of the Commission on Decentralisation.

Report of the Industrial Commission.

Report of the Tariff Commission.

India in 1918 and subsequent years.

Report on Moral and Material Progress.

Political Economy and Political Philosophy.

There will be eight papers each of three hours duration and each carrying 100 marks.

PAPER I—Economics and History of Economic Doctrines.

Books recommended :—

MARSHALL : Principles of Economics.

TAUSSIG : Principles of Economics.

WIESER : Natural Value.

CLARK : Essentials of Economic Theory.

GIDE & RIST : History of Economic Doctrines.

CANNAN : History of the Theories of Production and Distribution.

PAPER II—Modern Economic History of England, France Germany, United States of America, Russia and India.

Books recommended :—

CLAPHAM : Economic Development of France and Germany.

CUNNINGHAM : Growth of English Industry and Commerce.

KNOWLES : The Industrial and Commercial Revolutions.

OGG : Economic Development of Europe.

TOYNBEE : Industrial Revolution.

LIPPINCOTT : Economic Development of the United States of America.

ASHLEY : Modern Tariff History.

SHAH : History of Indian Tariffs,

MORELAND: India at the death of Akbar and from Akbar to Aurangzeb,

DUTT : India under early British Rule and India in the Victorian Age,

Paper III—

Comparative Politics :—

Books recommended :—

WARD FOWLER: City States of the Greeks and the Romans.

GUIZOT: Lectures on Civilization in Europe.

SIDGEWICK: Development of European Polity.

LOWELL: Governments and Parties in Continental Europe.

BRYCE: Modern Democracies.

Paper IV--

Essay on some Economic or Political Subject.

Either Group A. (Economics).

Paper V—

Money, Banking and Exchange.

Books recommended :—

MARSHALL: Money, Credit and Commerce.

FISHER: Purchasing Power of Money and Stabilising the Dollar.

KEMMERER: Modern Currency Reforms and the A.B.C. of the Federal Reserve System.

SCOTT: Money and Banking.

AGGER: Organised Banking.

CASSAL: Foreign Exchanges since 1914.

SHERRAS: Indian Currency, Banking and Finance.

Gold Currency in India (Government Compilation).

Chamberlain Commission Report.

Babington-Smith Committee Report.

Controller of Currency's Report.

Paper VI—

Principles and Administration of Public Finance

Books recommended :—

ADAMS: Science of Finance.

BASTABLE: Public Finance.

DALTON: Public Finance.

LEROY BEAULIEN: Public Finance.

WILLOUGHBY: Financial Administration of Great Britain.

HILTON YOUNG: System of National Finance.

GRICE: National and Local Finance.

SHAN: Sixty years of Indian Finance.

Indian Budgets for the last 10 years.

Paper VII—

Problems of Industrial Organisation.

Books recommended:—

WEBB: Industrial Democracy and History of Trade Unions.

LEVERHULME: The Six Hour Day.

BEVERIDGE: Unemployment.

PIGOU: Unemployment.

Factory Legislation in India (Government Publication).

HUTCHINSON AND HARRISON: History of Factory Legislation.

PURDOM: Town Theory and Practice.

GILLMAN: Profit Sharing and Methods of Industrial Peace.

BOWIE: Sharing Profits with Employees.

Paper VIII—

An original paper on any one of the Problems suggested for the year.

Or Group B. Political Philosophy.

Paper V—

Constitutional organisation of the British Empire, the Self-Government Dominions and India.

Books recommended:—

DICEY: Law of the Constitution.

LUCAS: Historical Geography of the British Colonies.

KEITH: Responsible Government in the Dominions.

BRAND: Union of South Africa.

CURTIS: The Problems of the Commonwealth.

DURHAM: Report on Canadian Self-Government.

ILBERT: Government of India.

LEE WARNER: Native States of India.

Report of the last Imperial Conference.

Paper VI—

Principles and History of Political Philosophy.

BLÜNTSCHLI: Theory of State.

GREEN: Lectures on Political Obligation.

JETHRO BROWN: Underlying Principles of Modern Legislation.

DUNNING: History of Political Theories 2 vols.

E. BARKER: Political Thought from Spencer to to-day.

RANGASWAMI IYENGAR: Some Aspects of Ancient Indian Polity.

Paper VII—

Either Comparative Study of Social and Political Institutions.

MAIN: Ancient Law (Pollock's Edition).

COULANGE: Ancient City.

FISHER: Bonapartism.

CARVER: Sociology and Social Progress.

GIDDINGS: Democracy and Empire.

KIDD: Social Evolution.

RISLEY: Census Report for India 1901.

Or Colonial and Local Government.

REINSCH: Colonial Government and Administration.

LEWIS: Government of Dependencies.

FAIRLIE: Municipal Administration.

GOODNOW: City Government in U. S. A.

SHAW: Municipal Government in Continental Europe.

P. ASHLEY: English Local Government.

DAWSON: Municipal Life and Government in Germany.

Mathematics.

The exam'nation shall consist of *eight* papers, each of three hours' duration and each carrying 100 marks. Can-

didate are required to offer Group A and to take either any subjects from Group B. or any two subjects from Group

GROUP A.

1. (a) *Integral Calculus*:—

Definite Integrals, Multiple Integrals, including Green's theorem and Dirichlet theorem, Line and Surface Integrals, Easy Integral Equations and use of Fourier's Series.

(b) *Differential Calculus*:—

Maxima and minima of functions of two or more independent variables, multiple points, curve tracing, change of variables and Jacobians.

2. (a) *Analytical Conics*:—

Areal Co-ordinates and Homogeneous Co-ordinates in General. Cross-ratios. Harmonic Section, Involution Reciprocation and Projection, Tangential equations Invariants and co-variants.

Books recommended:—

Askwith's *Analytical Geometry of Conic Sections*.

Salmon's *Conic Sections*.

(b) *Solid Geometry*—as in Charles Smith's "*Solid Geometry*."

3. *Differential Equations*—as in Forsyth's "*Differential Equations*" excluding Jacobi's Method and Partial Differential Equations of 2nd and higher orders with variable co-efficients.

4. *Algebra, Trigonometry and Theory of Equations*—as in Chrystal's *Algebra* Part II, Chapter XXXI, Chapter XXXV Arts. 1-18; Hobson's "*Trigonometry*," Chapters XIII-XVIII; Burnside and Panton's "*Theory of Equations*" Part I, and Chapter XIII of Part II.

5. *Statics*:—

Forces in three dimensions. The principle of Work. Centre of Gravity, Strings, Attractions and Potentials of rods, discs, spheres and spherical shells, homogeneous ellipsoids and ellipsoidal shells, Laplace's, Poisson's and Gauss's theorem.

Routh's "*Statics*" and Loney's "*Statics*" are recommended.

6. (a) *Dynamics of a Particle*—as in Loney's "Dynamics of a Particle and of Rigid Bodies," Chapters I-X.

(b) *Rigid Dynamics*: Limited to two dimensions, including Lagrange's Equations and their applications to easy problems.

Routh's "Elementary Treatise on Rigid Dynamics Chapters I-IV and Loney's" "Dynamics of a Particle and of Rigid Bodies," Chapters XI-XIV XVII-XIX are recommended.

GROUP B.

1. *Spherical Astronomy*—as in Sir R. S. Ball's "Treatise on Spherical Astronomy."

2. (a) *Hydrostatics*—as in Besant and Ramsay's "Hydro-mechanics Part I, excluding Chapters IX and X.

(b) *Hydrodynamics*—as in Basset's "Elementary Treatise on Hydrodynamics." Chapters I-IV, VI and VII.

3. *Harmonic Analysis*—with applications as in Byerley's "Fourier's Series and Spherical Harmonics."

4. *Dynamical Astronomy*—including Lunar and Planetary Theories, as in Plummer's "Dynamical Astronomy."

5. *The Theory of Integral Equations*—with applications as in Heywood and Frochet's "L'equation de Fredholm et ses applications a la Physique Mathematique," Vivanti's "Elementidella Teoria delle equazioni integrali lineari" may also be consulted.

GROUP C.

1. *The Theory of Aggregation and the Theory of Functions of a Real Variable*—as in the syllabus given in Schedule A given below.

2. *The Theory of Functions of a Complex Variable*—as in Hodrick's translation of Goursat's Cours d'Analyse Mathematique," Vol II, Part I.

3. *Differential Geometry*—as in the syllabus given in Schedule B given below. Forsyth's Differential Geometry is recommended.

4. (a) *Non-Euclidean Geometry* as in Chapters I-VII, X and XI-XIV of Coolidge's "Non-Euclidean Geometry."

- (b) Projective Geometry as in Cremona's "Projective Geometry" or the corresponding portions of Mathew's "Projective Geometry."

N. B.—In Coolidge's "Non-Euclidean Geometry" those parts of Chapters VIII and X which may be considered absolutely necessary for understanding the twelve chapters mentioned above should also be studied.

5. The Theory of Elliptic Functions with applications as in Appell and Lacour's "Theorie des fonctions elliptiques" and Greenhill's "The applications of Elliptic Functions."

SCHEDULE A.

1. *Theory of Aggregates.*

1. Irrational numbers. Cantor's and Dedekind's Theory. Arithmetical Theory of Limits. Convergent sequences
2. Theory of Aggregates or sets of points
 - (a) Definitions.—Limiting point, everywhere dense, dense in itself, closed, perfect, non-dense sets.
 - (b) Power or Potency of an Aggregate. Enumerable and unenumerable Aggregates, with fundamental theorems about rational, algebraic and real numbers
 - (c) Derivatives of Aggregates. Aggregates of the 1st and 2nd species, and those of the 1st and 2nd category.
 - (d) The content and measure of Aggregates.
 - (e) Heine-Borel Theorem on sets of intervals.
 - (f) Non-dense closed sets.

II. *Theory of functions of a Real Variable.*

1. Functions of Real Variables.
 - (a) Continuity of Functions of one or two real variables. Uniform continuity. Discontinuities of the first and second kind. Pointwise discontinuous functions and totally discontinuous functions.
 - (b) Monotone functions and function of bounded variation or limited total fluctuation.
 - (c) The derivatives of functions, Some important properties of derivatives. Continuous functions not possessing a differential co-efficient any-

where in a given interval. Partial differential co-efficients. Cases in which $\frac{d^2f}{dx dy}$ differs from

$\frac{d^2f}{dy dx}$ Maxima and minima of one or two real variables

2. Integration.

Riemann's definition of Integration. Labesgue's definition of Integration. Important properties of the definite Integral. The fundamental theorem of the Integral Calculus. Mean Value Theorems. Improper Integrals. Definitions of Double and repeated integrals. Content and measure of two dimensional sets. Rigorous proof of the rule for Integration by parts.

3. Series of Real Variables :—

- (a) Convergence of series. Uniform convergence. Tests of uniform convergence. Continuity of the sum function.
- (b) The convergence of power series. Product of two series. Taylor's Theorem. Lagrange, Cauchy and Schlomilch's forms for the Remainder in Taylor's Series. Expansibility in Taylor's series.
- (c) Double sequence and double series.
- (d) Differentiation and integration of series.
- (e) Cantor method of condensation of singularities.
- (f) Weierstrass's theorem on the representation of a continuous function by a series of polynomials.

Books suggested for consultation :—

HOBSON: Theory of Functions of a Real Variable (Camb. University Press).

PIERPOINT: Theory of Functions of a Real Variable (Ginn & Company, New York).

SCHEDULE B.

- I. Curves in space. Radii of curvature. Torsion. Spherical curvature. Frenet's Formulae. Moving Trihedron. Some special curves (e.g. the Helix, the Bertrand Curves etc.).

II. Surfaces :

- (A) The fundamental forms. The three fundamental differential equations. Gaussian curvature. Asymptotic lines. Lines of curvature. Conjugate Lines.
 - (B) Developable surfaces. Surfaces of constant positive curvature. Surfaces of constant negative curvature. Minimal surfaces. Some other special surfaces.
 - (C) Orthogonality. Conditions to be satisfied by orthogonal surfaces. Properties of orthogonal surfaces.
 - (D) Lines drawn on surfaces. Geodasic lines and their properties including those relating to curvature. Geodasic triangles. Isothermal lines.
 - (E) Quadrature and Cubature.
-

A Modern Indian Language and Literature.

There will be ten papers, each of three hours' duration and each carrying 100 marks. They will be distributed in the following manner :—

- (i), (ii) & (iii) Text-books ; the distribution of text-books among the papers shall be settled in each case by the Board of Studies concerned. There shall, however, be an adequate representation of all periods as well as departments of the literature.
- (iv) History of the Language and the Literature.
- (v) Essay on an advanced literary subject.
- (vi) Translation from English or a Classical Language (Arabic, Persian or Samskrit) into the Modern Indian Language and from the Modern Indian Language into English.
- (vii) Principles of criticism. The Board of Studies may prescribe for this paper, original works of criticism from Western as well as from Oriental literature.
- (viii) Comparative Philology with special reference to Indian languages.

- (ix) A subsidiary modern Indian language to be selected from a group prescribed by the Board of Studies concerned, the standard being that of the Intermediate course.
- (x) A special author or period of literature. It shall, however, be open for a candidate to offer a thesis on the subject-matter of the last paper in lieu of the examination in that paper.

Paper I—

- (1) *Prithviraj Raso* of Chand Bardai, Chapter II.
- (2) *Bisakdev Raso* of Narpati Nalh.
- (3) *Padmavata* by Malika Muhammada Jayasi. (N. P. Sabha Edition).

Paper II—

- (1) *Satusai* of Bihari Lala.
- (2) *Bhramara Gita* of Sura Dasa.
- (3) *Gitavali* of Tulasi Dasa. (N. P. Sabha Edition).
- (4) *Rama Chandrika* of Kesava Dasa. (N. P. Sabha Edition).

Paper III—

- (1) *Mudraraksasa* by Bharatendu Harishchandra.
- (2) *Uttara Rama Charita* by Satyanarayana Kavi-ratna).
- (3) *Kudambari* by Rishishwarnath Bhatta.
- (4) *Prema Sugara* by Lallulal (N. P. Sabha Edition).
- (5) *Nasiketopakhyana* by Sadal Misra.
- (6) *Rani Ketaki Ki Kahani* by Insa Allah Khan.
- (7) *Ramaswayamvara* by Raghuraj Singh (abridged-N. P. Sabha Edition).
- (8) *Priya Pravasa* by Ayodhya Singh Upadhyaya (Chaps. I—X).
- (9) *Buddha Charitra* by Ramachandra Shukla.

N.B.— Questions on Hindi Prosody and Rhetoric may be set in any or all of these three papers. The following books are recommended for study —

- (a) BHIKHARI DASA: *Kavya-Nirnaya*.
- (b) PRATAPA SAHI. *Vyangyārtha Kāumudī*.
- (c) JAGANNATH PRASAD BHANU: *Chhaṇḍa-Prabhākara*.

Paper IV—

- (1) *Misra Bandhu Vinoda.*
- (2) Keay's History of Hindi Literature.
- (3) Greaves' Sketch of Hindi Literature.
- (4) M. P. DWIVEDI: *Hindi ki Utpatti.*
- (5) *Siva Singh Saraju.*

* * *

Paper VII—

- (1) WORSFOLD: Principles of Criticism.
- (2) HUDSON. Introduction to the Study of Literature.
- (3) SHYAM SUNDAR DAS: *Sahityalochana.*
- (4) *Dasa Rupaka* of Dhananjaya.
- (5) *Sahitya Darpana* (Hindi translation) by Saligram Shastri.
- (6) ARISTOTLE: Poetics (Butcher's Edition).

Paper VIII—

- (1) DR. BHANDARKAR. Wilson Philological Lectures.
- (2) WOOLNER: Introduction to Prakrita.
- (3) GUNE: Introduction to Comparative Philology.
- (4) HEM CHANDRA: Prakrt Grammar (Apabhramsa portion only).
- (5) SHYAM SUNDAR DAS: *Bhasa Vijnana.*
- (6) KAMTA PRASAD GURU'S Hindi Grammar (Philological Portion only)

Paper IX—

(Bengali).

- (1) *Sonar Tari* by Rabindranath Tagore.
- (2) *Alo-o Chhaya* by Mrs. Kamini Rai.
- (3) *Sarada-Mangala* by Beharilal Chakravartty.
- (4) *Prabhata Chinta* by Kaliprasanna Ghose.
- (5) *Manavatattva* by Bireswar Pandey.
- (6) *Durgesha Nandini* by Bankim Chandra Chatterji.
- (7) *Chandra* by Girish Chandra Ghose.

(Urdu).

- (a) Prose—*Ude Hindi* by Ghalib.
- (v) Poetry—*Musaddas-e Hali.*

- (c) Literary History—the first one hundred and twenty-eight pages of *Ab-e-Hayat* and *Muqaddama-e-Shair-o-Shairi* by Hali.
- (d) Grammar—*Qavaid-e-Urdu* by Maulvi Abdul Haq *Anjuman Taraqqiy-e-Urdu*, Aurangabad (Deccan).

(Gujrati).

- (1) जया जयन्त by Nana D.-Kavi.
- (2) हृदय बीणा by N. B. Divatia.
- (3) सरस्वती चन्द्र Parts I and II by G. N. Tripathi.
- (4) Bhalan's कादम्बरी Part I Edited by K. H. Dhruva.

Books recommended for Philology :—

Mr. N. B. Divatia's Philological Lectures on the Gujarati Language.

Rao Bahadur K. P. Trivedi's *Brihadvyakarana* of the Gujarati Language.

Paper X--

Any one of the following may be chosen :—

- (a) Tulasi Dasa and his times.
- (b) The Bardic Chronicles in Hindi.
- (c) The Modern Hindi Prose.
- (d) The Romantic Poetry in Hindi.
- (e) Kesava Dasa and his School.
- (f) Harishchandra and his time.

Ancient Indian History and Culture.

There will be eight papers each of three hours' duration and each carrying 100 marks.

Paper I

History: Ancient India :—From the Earliest Times to 78 A. D.

The subject may be studied with the help of the following books :—

Cambridge History of Ancient India Vol. I.

Pargiter :—Ancient Indian Historical Tradition.

Asoka Inscriptions.

Hathigumpha Cave Inscriptions.

Books for reference :—

MACDONELL AND KEITH: *Vedic Index*.

P. T. S. IYENGAR: *The Age of the Mantras*.

A. C. DAS: *The Rigvedic Age*

K. C. DUTT: *Civilisation of Ancient India*.

FICK: *Social Organisation in N. E. India in Buddha's Time*.

C. V. VAIDYA: *Epic India*.

The Riddle of the Ramayana.

The Mahabharata: A criticism.

MC CRINDLE: *Megasthenes and Arrian*.

CUNNINGHAM: *Ancient Geography of India (with later modifications)*.

RAWLINSON: *Intercourse between India and the Western World*

Paper II—History of Ancient India, From 78 A. D. to 1100 A. D.

The subject may be studied with the help of the following books:—

V. A. SMITH: *Early History of India (Latest Edition)*.

RAPSON: *A catalogue of the Kshatraps and the Andhra coins in the British Museum*.

R. G. BILANDKAR: *History of the Early Deccan*.

C. V. IYENGAR: *Ancient India*.

FLEET: *Inscriptions of the Early Gupta King*.

Books for reference:—

DUTT: *Civilisation of Ancient India*.

JOUBEAU DUBRIEUL: *Ancient History of the Deccan*.

" " : *Pallava Antiquities*.

C. V. VAIDYA: *A History of Medieval Hindu India*.

LEGGE: *Fa Hian*.

WATTERS: *Yuan Chwang*.

TAKAKASU: *I-tsing*.

Paper III.—Religion and Philosophy: Brahmana:—

The subject may be studied with the help of the following books:—

FARQUHAR:—*An outline of the Religious Literature of India*.

M. DONELL: *Vedic Mythology*.

HOPKINS: Religions of India.

DEUSSEN: Philosophy of the Upanishads.

KADHA KRISHNAN: Indian Philosophy.

MAX MULLAR: Six Systems of Indian Philosophy.

TILAK: Gita-rahasya

R. G. BHANDARKAR: Vaisnavism, Shaivism etc

Books for reference :—

Selections from the Vedic Samhitas, Brahmanas, Aranyakas and Upanishads.

Selections from the Ramayana, the Mahabharata and the Bhagavata Purana, Sruta, Grihya, and Dharma Sutras,

Bhakti Sutras of Narada and Sandilya

Sivasutravimarsini.

Ahribudhnya Samhita

Mahanirvanatantra

RAGOZIN: Vedic India.

BLOOMFIELD: Religion of the Rigveda

EGGLING: Introduction to the Satapatha Brahmana
S. B. E.

HANG: Introduction to the Aitareya Brahmana.

SATISH CHANDRA VIDYABHUSANA: History of Indian Logic.

DAS GUPTA: History of Indian Philosophy.

KEITH: Manuals on

Sankhya.

Karmamimamsa.

Nyaya-Vaisesika (Indian Logic and Atomism)

KANE: A brief sketch of the Purvamimamsa system.

MADHAVA: Sarvadarsanasamgraha.

YAJNESHWARA SASTRI: Aryavidyasudhakara.

MACNICOL: Indian Theism.

CARPENTER: Theism in Medieval India.

WOODROFFE: The World as a Power Reality.

Paper IV.—Religion and Philosophy: Jaina and Buddha.

The subject may be studied with the help of the following books:—

KERN: Indian Buddhism.

WARREN : Buddhism in Translation.

RHYS DAVIDS : Buddhism (American Lectures ;

MRS RHYS DAVIDS : Buddhism (Home University Library).

KEITH : Buddhist Philosophy.

MRS. STEVENSON : The Heart of Jainism

JAINI : Outlines of Jainism.

HERBERT WARREN : Jainism.

Books for reference:—

SUZUKI : Outlines of Mahayana Buddhism.

SOGEN : Systems of Buddhistic Thought.

BAPIA : Prolegomena to a History of Buddhistic Philosophy.

S SUGIURA : Hindu Logic as preserved in China and Japan.

Selections from Jaina Sutras:—

Acharanga

Uttaradhyayana

Tattvarthadigama Sutras (with Bhasya).

Dravyasangraha

Saptabhaṅgitarāṅgini

Hemachandra :—Trisasti-salaka-puruṣa charitra.

Selections from Buddhistic Sutras.

Dīgha Nikāya

Majjhima Nikāya

Samyutta Nikāya

Dhammapada

Selections from the Jātakas.

Lankavatara

Mahāyānasūtralankāra

Madhyamika Vṛitti

Paper V.—Sanskrit Literature:—

The subject may be studied with the help of the following books:—

MACDONELL : History of Sanskrit Literature ; Chapter X to end.

KEITH : Classical Sanskrit Literature. Chapters I-IX.

„ Sanskrit Drama Parts I and II

Books for reference:—

Vedic Hymns, and Stories in the Brahmanas and the Upanisads, as specimens of Literature.

The Mahabharata and the Ramayana
 Svapnavasavadatta
 Pratijnayaugandharayana
 Pratima
 Buddhacharita
 Mrchchhakatika
 Sakuntala
 Raghuvansa
 Kumarasambhava
 Meghaduta
 Dasakumaracharita
 Kadambari
 Ratnavali
 Uttararamacharita
 Malati Madhava
 Mudrarakshasa
 Karpuramanjari
 Katha Saritsagara
 Mahabharata Champu
 Prabodhachandrodaya

Paper VI.—Poetics, Dramaturgy, Arts and Science:—

The subject may be studied with the help of the following books:—

KEITH: Classical Sanskrit Literature. Chapter X.

„ The Sanskrit Drama Part III.

KANE: Sahityadarpana with History of Sanskrit Poetics.

DE: Sanskrit Poetics.

DASARUPAKA: (Columbia Edition).

KAVYAPRAKASA: Ullasas I, IV, V, VII, VIII, IX, X

SEAL: Positive Sciences of Ancient Hindus.

V. A. SMITH: Fine Arts in India and Ceylon.

Books for reference :

BHARATA: Nāṭya-sāstra Chapters I, II, V, VI, VII.

Kavyadarsa.

Kavyalamkarasutra.

Dhvanyaloka.

Kavyamimamsa.

Aucūtyavicharacharcha.

Wilson.—Hindu Theatre.

Sulvasutra.

Panchasiddhantika edited by Dr. Thibaut.

Charaka.

Susruta

P, C. ROY: Hindu Chemistry.

FERGUSSON : History of Indian and Eastern Architecture.

HAVELL : Hand-book of Indian Art.

COOMARSWAMI : Indian Arts.

PERRY BROWNE : Indian Painting.

Paper VII—Law and Sociology:—

The subject may be studied with the help of the following books:—

Paraskara Grihya Sutras.

Gautama Dharma Sutras.

Manusmriti.

Yajnavalkyasmriti Vyavaharadhyaya.

Naradasmriti.

Dr. Sen:—Hindu Jurisprudence.

Books for reference:—

Apastamba Dharma Sutras.

Baudhayana Dharma Sutras.

Vasistha Dharma Sutras.

Parasarasmruti with Madhava's Commentary.

Smrtichandrika.

Mitaksara on Vyavaharadhyaya.

Introductions to S. B. E, Vols. II, XIV, XIX, XXX.

Hunter's Introduction to Roman Law.

D. N. Mitter.—Position of Women under the Hindu Law.

Tagore Law Lectures on Inheritance, Marriage and Stridhana.

Bhagavandas—The Science of Social Organisation.

Paper VIII—Administration and Politics:—

The subject may be studied with the help of the following books:—

KAUTILYA : Arthasastra.

MAHABHARATA : Santi Parvan (Rajadharma).

JAYASWAL : Hindu Polity.

P. N, BANERJI: Public Administration in Ancient India.

Books for reference—

Aitareya Brahmana Chapters VII and VIII.

Kamandakiya Nitisara.

Barhaspatya Arthasastra.

Sukraniti.

GHOSAL : A History of the Hindu Political Theories.

N, N. LAW: Ancient Indian Polity.

B. K. SARKAR : Political Theories of the Hindus.

R. C. MAJUMDAR : Corporate Life in Ancient India.

R. K. MUKERJI : Local Government in Ancient India.

S. K. DAS : Economic History of Ancient India.

N. B.—These books are not meant to be used as prescribed text-books but only as books indicating the general scope of studies in the subject.

The candidate may offer, in lieu of any one these Papers, a thesis connected with that paper.

The M.Sc. Examination.

REGULATIONS—CHAPTER XXXIII.

1. The Examination for the degree of Master of Science shall be held once a year at Benares at such time and on such dates as the Syndicate may prescribe.

2. The examination shall be open to candidates who have obtained the degree of B.Sc. in this University, or, in special cases, by permission of the Syndicate, the degree of B.Sc. or the degree of B.A. with Science subjects, in some other Indian University established by Act of the Legislature, or the University of Mysore and have, after obtaining that degree, completed a regular course of study for not less than two years in the University or in a constituent College.

3. A candidate shall apply to the Registrar, in such form as the Syndicate may prescribe. His application and fee shall be despatched through the prescribed channel, so as to reach the Registrar at least four weeks before the commencement of the examination.

4. The examination shall be conducted by means of papers, and may also be *viva voce*, and in subjects which

admit of it, candidates shall also be required to undergo practical examination.

5. A candidate may be examined in any *one* of the following subjects :—

- (1) Mathematics.
- (2) Chemistry.
- (3) Physics.
- (4) Zoology.
- (5) Mineralogy.
- (6) Geology.
- (7) Botany.

6. Failure to pass or appear at the Examination shall not disqualify a candidate for presenting himself at any subsequent examination, on a new application being forwarded and a further fee paid. Such a candidate shall not be required to prosecute a further course of study in the University or in a constituent college.

Syllabus and Text-books (M.Sc.).

Mathematics.

(Same as for the M.A. Examination).

Chemistry.

The subjects of examination in Chemistry shall be :—

- (1) Inorganic Chemistry.
- (2) Organic Chemistry.
- (3) Physical Chemistry.

The Historical aspect will be emphasised in all the three subjects. The examination will consist of two parts, theoretical and practical in each of which the candidates must pass separately.

THEORETICAL.

There will be four papers. Each paper will be of three hours' duration and will carry the maximum of 100 marks.

Paper I—

Inorganic Chemistry.

Paper II—

Organic Chemistry.

Paper III—

Physical Chemistry.

Paper IV—

A special paper on any of the branches of the above subjects, chosen by the Board of Studies in Chemistry from time to time.

The following are the subjects recommended for the present:—

1. Inorganic
 - (a) Rare earths,
 - (b) Chemistry of Per Acids and Per Salts.
 - (c) Formation of Nitrogen.
2. Organic
 - (a) Carbohydrates,
 - (b) Alkaloids,
 - (c) Organic Dye-stuffs.
3. Physical Chemistry
 - (a) Colloids,
 - (b) Absorption,
 - (c) Radio-Activity.

A knowledge of elementary crystallography will also be required.

The candidates will be expected to be acquainted with the more important recent work in connection with the subject-matter of Paper IV.

PRACTICAL.

Corresponding to the subject matter of each of the papers there will be a practical examination carrying a total of 400 marks.

PROVISION FOR RESEARCH.

A candidate wishing to specialise by research can do so by substituting for Paper IV and the corresponding practical paper a thesis embodying the results of an original investigation carried out by him in the B. H. U. Laboratories. Such a candidate shall have to seek the permission of the Syndicate at least six months before commencement of the examination. He will be required to present himself for a viva voce on the subject-matter of his thesis before the examiners at the time of the practical examination.

Books recommended for study:—

Paper I.—

COHEN : Organic Chemistry for Advanced Students
Volumes I, II, III

BERNTHSEN : Organic Chemistry

L'OEPE : Modern Research in Organic Chemistry

STEWART : Recent Advances in Organic Chemistry.

Paper II—

MELLOR : Modern Inorganic Chemistry

STEWART : Recent Advances in Physical and Inorganic Chemistry

**ROSCOE AND SCHARLEMEN : Treatise in Chemistry
Volumes I and II (for reference).**

NEWTON FRIEND : Theory of Valency

Paper III—

LEWIS : System of Physical Chemistry Volumes I & II

STEWART : Recent Advances in Physical and Inorganic Chemistry.

NERNST : Theoretical Chemistry.

EMIL HATSCHELL : Colloids

Paper IV—

Journals and Annual Report of the Progress of Chemistry.

LIST OF PRACTICAL EXPERIMENTS.

PHYSICAL CHEMISTRY.

1. Partition Co-efficients
2. Surface tension. Comparative and absolute
 - (a) Capillary rise method
 - (b) Maximum pull method
 - (c) Drop pippette method
3. Viscosity of liquids
Viscosity of solutions and mixtures
4. Comparison of E. M. F. of Cells
Determination of absolute E. M. F.
5. Internal resistance of a cell
6. Conductivity of solutions
7. Ionic Mobility
8. Order of reactions
9. Refractive indices of liquids
10. Verification of the Law of Mass Action

11. Relation between constitution and refractive indices,
12. Identification of the more important elements by spectroscopy.
13. Preparation and purification of Colloids.
14. Experiments on Colloids:—
 - (a) Sign of charge on the particles
 - (b) Determination of rate of coagulation
15. Specific heats of solutions
16. Strength of Acids
17. Ionisation of gases
18. Transition point
19. Determination of molecular weights by Cryscopic and Ebulliscopic methods
20. Determination of solubilities
21. Vapour pressure of saturated solutions
22. Heat of Formation
23. Heat of Neutralization
24. Heat of Combustion
25. Verification of Stoke's Law.

(PRACTICAL WORK).

(1) Inorganic

A. Qualitative

- (i) Complex inorganic qualitative analysis containing five or six metallic radicals
- (ii) Individual tests and reactions of the following rare elements:—
Titanium, Thungsten, Molybdenum, Uranium, Rubidium, Caesium, Thorium, Cerium, Platinum.

B. Volumetric estimation of—

- (i) Iron in an iron ore
- (ii) Silver and copper in a silver coin
- (iii) Manganese dioxide in pyrolusite
- (iv) Antimony in tartar emiti
- (v) Uranium in uranium salt.

C. Gravimetric Analysis :—

- (i) Dolomite, iron pyrites, galena, barytes chrome iron ore.
- (ii) Complete analysis of glass, type metal, brass, nickel coin.
- (iii) Estimation of titanium in Ilmenite, Thorium and cerium in a gas mantle, Tungston in wolfram.

(II) Organic

A. (1) Detection of simple organic substances

- (2) Separation and identification of the constituents of a mixture containing two ingredients, the separation not involving complicated methods.
- (3) Preparation of typical organic compounds such as Brom. Acetic acid, brom benzene-Bnaphthol-anthra quinone-alizarine-methyl-orange malachite greenzincethyl-ethyl acetate-quinine from cinchona bark.

B Organic Analysis

- (1) Estimation of CHN and Cl in organic compounds
- (2) Estimation of Methoxy, hydroxy, and carboxylic group in organic compounds
- (3) Estimation of sucrose in sample of sugar.
- (4) Analysis of one of the following; Soap, oil, milk, and
- (5) Determination of the molecular weights of organic acids and bases by chemical methods.

C. Gas Analysis

Some simple experiments in gas analysis.

Physics.

Every candidate shall be required to pass a Theoretical and a Practical Examination.

The Theoretical Examination shall consist of six papers each of three hours' duration and each carrying 100 marks.

Paper I.**General Theory of Electricity****Paper II.****Electron Theory****Paper III.****Physical Optics and Electromagnetic Theory of Light.****Paper IV****Geometrical Optics and optical instruments and measurements.****Paper V.****(i) General Principles of Thermodynamics and Kinetic Theory.****(ii) General Properties of Matter.****Paper VI.****On a special subject to be selected from the list given below.****The scope of the examination is approximately indicated by the following books:—****PIDDUCK: Electricity and Magnetism.****CROWTHER: Ions, Electrons and Radiation****WOOD: Physical Optics****HOUSTON: Treatise on Optics.****DRUDE: Optics Part I.****PRESTON: Theory of Heat****BOYNTON: Kinetic Theory.****PLANK: Thermo Dynamics (First 118 pages)****LEWIS: A System of Physical Chemistry Vol. III
Quantum theory Chapters I, II, III & V
only.****POYNTING AND THOMSON: Properties of Matter****PERVIN: Brownian Movement.****(List of special subjects)****(1) Applied Electricity.****(2) Electron Theory with applications.****(3) Spectroscopy.****(4) Thermodynamics including Thermodynamics
of Heat Engines.****(5) Acoustics.****(6) Strength of materials and Elasticity.****(7) Any other subject which the Board of Studies
in Physics may recommend from time to**

time and which is approved by the Faculty of Science.

NOTE:—In every special subject offered by a candidate there shall be a special advanced course of not less than 25 lectures with facilities for Practical Work. For the special subject, students are requested to consult their Professors as to a suitable course of reading.

The practical examination shall last for a period of at least 4 days and will include a Viva Voce Examination. The examination shall consist of 6 parts each corresponding to the subjects of each of the Theoretical Papers. There will be 50 marks for each part.

Candidates at the end of a year's work may apply to the Syndicate to take up Research and substitute a Research Thesis in place of either the II or the III Theoretical paper and in the Practical examination in any two groups of subjects. The thesis will carry 250 marks.

Candidates must pass separately in the aggregates of the Theoretical as well as the Practical Examinations.

Candidates are expected to attend a course of preparatory lectures in Pure and Applied Mathematics to enable them to follow intelligently the lectures in Theoretical Physics.

Zoology.

1. The Structure, Habits, Development, Distribution in Time and Space, and Classification of the following groups :—

Protozoa, Porifera, Coelenterata, Platyhelminia, Nemertea, Nemathelminia, Rotifera, Molluscoida, Echinodermata, Annelida, Arthropoda, Mollusca, Hemichordata, Urochordata, Cephalochordata, and Vertebrata.

2. The cell together with the leading structural modifications and functional relationships of its constituent parts.
3. Evidences bearing upon the Hypothesis of Evolution, General Theories of Variation, Adaptation, Heredity, Sex and Origin of Species.
4. A detailed practical study of the Embryology of Chick.

A dissertation on some special subject,

The candidate shall exhibit a knowledge of recent work on the subject chosen, and include an account of practical work performed by him, which may be original or otherwise. At the time of the examination he may submit a thesis, a series of preparations, or other evidence of his work.

There will be five papers each of three hours' duration and each carrying 100 marks except Paper III which will carry 200 marks. There will also be a practical examination carrying 300 marks.

Paper I—

Invertebrata.

Paper II—

Chordata

Paper III—

Dissertation.

Paper IV—

General Biology and Cytology

Paper V—

Essay.

In the Practical Examination, the candidates will be expected to show a practical knowledge of the methods of anatomical and histological research and they will also be required to submit their original Note Books of the work done by them before the commencement of the Practical Examination.

Books and Journals recommended for consultation —

PARKER AND HASWELL: Text-Book of Zoology.

SEDGWICK: Students' Text-Book of Zoology.

The Cambridge Natural History.

LANKESTER: Treatise on Zoology.

WEISMANN: The Evolution Theory.

LULL: Organic Evolution.

CASTLE AND COULTER: Heredity and Eugenics.

THOMSON: Heredity.

PUNNETT: Mendelism

DONCASTER: Determination of Sex

MORGAN: Experimental Zoology.

WILSON: The Cell.

DONCASTER: Cytology.

KEILICOFF: Text-Book of General Embryology.

ZITTELL: Text Book of Palæontology.

WALLACE: Geographical Distribution.

LYDEKKER: Geographical History of Mammals

HEILPRIN: Distribution of Animals.

MINCHIN: Protozoa

NEWMAN: Vertebrate Zoology

MACBRIDE: Embryology.

Journals—Q J. M. S. P. Z S P. R. S and Journal of Morphology (students are expected to consult these and other journals of importance)

Mineralogy.

(Course to be prescribed later on)

Geology.

There shall be six papers each of three hours' duration and each carrying 100 marks. There shall also be a practical examination carrying 400 marks.

Paper I—

Crystallography, Mineralogy and Petrology

Paper II—

Physiography and Dynamical Geology

Paper III—

Structural Geology, Topographic Surveying and Palæontology.

Paper IV—

Stratigraphical and Indian Geology.

Paper V—

Economic Geology Part I

Paper VI—

Economic Geology Part II.

Practical Examination in Crystallography, Mineralogy, Palæontology, Petrology, Topographic Surveying and construction and interpretation of maps and sections.

Note.—The record of the practical work done in the laboratory and in the field will be taken into consideration in assigning marks in the practical examination.

THE FOLLOWING SYLLABUS IS PRESCRIBED.

Crystallography

The principal groups of symmetry. Crystal structure

The Reflecting Goniometer The measurement of simple crystals and the calculation of their crystallographic elements.

Mineralogy.

The principles involved in the identification of minerals by their geometrical and optical properties; the application of these principles to the use of the petrological microscope. A systematic description of the minerals met with as constituents of rocks, their crystalline form and physical properties, chemical composition and alteration products, modes of occurrence and origin. The practical study of a representative series of such minerals in hand specimens and under the microscope.

Petrology

Igneous Rocks; methods of examination of thin sections and separations by chemical and optical means; determination and expression of mineral composition; recognition and classification of rock types; the physical and chemical characters of magmas; rock structures; mechanics of intrusion. Sedimentary rocks. Thermal and dynamic metamorphism. The practical study of a selected series of rocks and sections in hand specimens and under the microscope; chemical analysis of rocks and their interpretation.

Physiography and Dynamical Geology.

The theories of the earth. The probable condition of the earth's interior. Radio-activity.

Earthquakes and sea-quakes, Block movements. Earthquake zones

Volcanoes—Active and extinct volcanoes, volcanic belts; types of volcanic mountains; mechanics of crater explosions; notable eruptions.

Denudation, transportation and sedimentation.

Rivers—their life histories. The river valley cycle.

The waves and breakers, shore current, shorelines
coast records of rise or fall of land.

Glaciers and glaciation The glacial periods.

Lakes—Their types, situation and origin. Relation-
ship to geological processes.

Mountains—Their origin and form Instability of the
earth's crust.

The atmosphere—Its composition, temperature, pres-
sure, moisture and movements Meteorological instru-
ments; weather and climate, reading and interpreta-
tion of weather maps and reports Forecasting of
weather.

Structural Geology

Rock-structures. Faulting and folding Stratum con-
tours and convergence diagram.

The methods of making and interpreting geological
maps and sections. The actual geological mapping of
a selected area in the field.

Topographic Surveying

Introductory sketch of the various methods of survey-
ing, levelling and field-sketching. Scales of maps
and their influence on surveying methods.

Instruments—compasses, clinometers, plane tables,
tachometers, theodolites, cameras, levels, barometers,
hypsonetric thermometers, etc. Route Surveys.
Determinations of azimuth and latitude Local
topographic surveys—determining position on existing
map and filling in details in the vicinity. Levelling
and contouring. Tracing the probable run of outcrops
of beds, veins etc. Setting out boundaries, roads,
water races, etc.

Office work—Reduction of results and plotting. A
course of field-work corresponding to the above.

Palæontology.

The important genera from the chief groups of fossil
invertebrata.

Stratigraphical Geology.

The advanced study of the rock-formations of India
and a general study of their foreign representatives.

Economic Geology

The practical study of the metallic and non-metallic
minerals of economic value. Their occurrence
and commercial uses. The processes of ore-genesis.

Secondary enrichment. The ore deposits of India, and the more important ore deposits of the world.

Coal—Its origin, distribution, classification and commercial uses. The coal-fields of India.

Petroleum—Its origin and Mode of occurrence. The oil-fields of India and Burma. The principal oil-fields of the world. Natural gas and oil shales,

Geology in its connection with Engineering Problems of water-supply, lines of transport, quarrying, building materials, soils and subsoils. Mineral statistics Methods of prospecting. General economic considerations as regards the value of an ore-deposit The common methods of mining, the dressing of ores, and their metallurgical treatment.

PRACTICAL WORK.

The measurement of simple crystals by means of the reflecting goniometer, and the calculation of the crystallographic elements.

The study of the rock-forming minerals in hand specimens and under the microscope Preparation of rock slides, separation of minerals by the electromagnet and the diffusion column. Separation of sand, mud, and silt by means of the elutriator. Examination of heavy residues from sands.

The study of a representative series of rocks and sections in hand specimens and under the microscope. Chemical analysis of a few rocks in the laboratory.

The preparation and interpretation of geological maps and sections. The geological mapping of a selected area in the field.

The study of the important genera of the fossil invertebrata.

The recognition in hand specimens and by blow-pipe tests of the metallic and non-metallic minerals of economic importance. Visits to mineralized areas in India and Burma.

A course of field work in topographic surveying. Reduction of results and plotting.

Books recommended :—

1. "Text-book of Geology" Vols. I and II—by A. G. Hibbard (Macmillan.)

time and which is approved by the Faculty of Science.

NOTE:—In every special subject offered by a candidate there shall be a special advanced course of not less than 25 lectures with facilities for Practical Work. For the special subject, students are requested to consult their Professors as to a suitable course of reading.

The practical examination shall last for a period of at least 4 days and will include a Viva Voce Examination. The examination shall consist of 6 parts each corresponding to the subjects of each of the Theoretical Papers. There will be 50 marks for each part.

Candidates at the end of a year's work may apply to the Syndicate to take up Research and substitute a Research Thesis in place of either the II or the III Theoretical paper and in the Practical examination in any two groups of subjects. The thesis will carry 250 marks.

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Candidates are expected to attend a course of preparatory lectures in Pure and Applied Mathematics to enable them to follow intelligently the lectures in Theoretical Physics.

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Protozoa, Porifera, Coelenterata, Platyhelminia, Nemertea, Nemathelminia, Rotifera, Molluscoida, Echinodermata, Annelida, Arthropoda, Mollusca, Hemichordata, Urochordata, Cephalochordata, and Vertebrata

2. The cell together with the leading structural modifications and functional relationships of its constituent parts.
3. Evidences bearing upon the Hypothesis of Evolution, General Theories of Variation, Adaptation, Heredity, Sex and Origin of Species.
4. A detailed practical study of the Embryology of Chick.

A dissertation on some special subject.

The candidate shall exhibit a knowledge of recent work on the subject chosen, and include an account of practical work performed by him, which may be original, or otherwise. At the time of the examination he may submit a thesis, a series of preparations, or other evidence of his work.

There will be five papers each of three hours' duration and each carrying 100 marks except Paper I[1] which will carry 200 marks. There will also be a practical examination carrying 300 marks.

Paper I—

Invertebrata

Paper II—

Chordata

Paper III—

Dissertation.

Paper IV—

General Biology and Cytology

Paper V—

Essay.

In the Practical Examination, the candidates will be expected to show a practical knowledge of the methods of anatomical and histological research and they will also be required to submit their original Note Books of the work done by them before the commencement of the Practical Examination.

Books and Journals recommended for consultation .—

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SEDGWICK: Students' Text-Book of Zoology.

The Cambridge Natural History.

LANKESTER: Treatise on Zoology.

WEISMANN: The Evolution Theory.

LULL: Organic Evolution.

CASTLE AND COUTLER: Heredity and Eugenics

THOMSON: Heredity

PUNNETT: Mendelism.

DONCASTER: Determination of Sex.

MORGAN: Experimental Zoology.

WILSON: The Cell.

DONCASTER: Cytology.

KEILICOLTA: Text-Book of General Embryology.

ZITTELL: Text Book of Palæontology.

WALLACE: Geographical Distribution.

LYDEKKER: Geographical History of Mammals

HEILPRIN: Distribution of Animals.

MINCHIN: Protozoa

NEWMAN: Vertebrate Zoology.

MACBRIDE. Embryology.

Journals - Q J. M. S. P Z S. P. R. S and Journal of Morphology (students are expected to consult these and other journals of importance)

Mineralogy.

(Course to be prescribed later on)

Geology.

There shall be six papers each of three hours' duration and each carrying 100 marks. There shall also be a practical examination carrying 400 marks.

Paper I—

Crystallography, Mineralogy and Petrology.

Paper II—

Physiography and Dynamical Geology

Paper III—

Structural Geology, Topographic Surveying and Palæontology

Paper IV—

Stratigraphical and Indian Geology.

Paper V—

Economic Geology Part I

Paper VI—

Economic Geology Part II.

Practical Examination in Crystallography, Mineralogy, Palæontology, Petrology, Topographic Surveying and construction and interpretation of maps and sections.

Note.—The record of the practical work done in the laboratory and in the field will be taken into consideration in assigning marks in the practical examination.

THE FOLLOWING SYLLABUS IS PRESCRIBED.

Crystallography.

The principal groups of symmetry. Crystal structure

The Reflecting Goniometer. The measurement of simple crystals and the calculation of their crystallographic elements.

Mineralogy.

The principles involved in the identification of minerals by their geometrical and optical properties; the application of these principles to the use of the petrological microscope. A systematic description of the minerals met with as constituents of rocks, their crystalline form and physical properties, chemical composition and alteration products, modes of occurrence and origin. The practical study of a representative series of such minerals in hand specimens and under the microscope.

Petrology.

Igneous Rocks; methods of examination of thin sections and separations by chemical and optical means; determination and expression of mineral composition; recognition and classification of rock types; the physical and chemical characters of magmas; rock structures; mechanics of intrusion. Sedimentary rocks. Thermal and dynamic metamorphism. The practical study of a selected series of rocks and sections in hand specimens and under the microscope; chemical analysis of rocks and their interpretation.

Physiography and Dynamical Geology.

The theories of the earth. The probable condition of the earth's interior. Radio-activity.

Earthquakes and sea-quakes, Block movements. Earthquake zones.

Volcanoes—Active and extinct volcanoes, volcanic belts; types of volcanic mountains; mechanics of crater explosions; notable eruptions.

Denudation, transportation and sedimentation.

Rivers—their life histories. The river valley cycle.

The waves and breakers, shore current, shorelines, coast records of rise or fall of land.

Glaciers and glaciation The glacial periods.

Lakes—Their types, situation and origin. Relationship to geological processes.

Mountains—Their origin and form Instability of the earth's crust.

The atmosphere—Its composition, temperature, pressure, moisture and movements Meteorological instruments; weather and climate, reading and interpretation of weather maps and reports Forecasting of weather.

Structural Geology

Rock-structures. Faulting and folding Stratum contours and convergence diagram.

The methods of making and interpreting geological maps and sections. The actual geological mapping of a selected area in the field.

Topographic Surveying

Introductory sketch of the various methods of surveying, levelling and field-sketching. Scales of maps and their influence on surveying methods.

Instruments—compasses, clinometers, plane tables, tacheometers, theodolites, cameras, levels, barometers, hypsometric thermometers, etc. Route Surveys. Determinations of azimuth and latitude Local topographic surveys—determining position on existing map and filling in details in the vicinity. Levelling and contouring. Tracing the probable run of outcrops of beds, veins etc. Setting out boundaries, roads, water races, etc.

Office work—Reduction of results and plotting. A course of field-work corresponding to the above.

Palaontology

The important genera from the chief groups of fossil invertebrata.

Stratigraphical Geology.

The advanced study of the rock-formations of India and a general study of their foreign representatives.

Economic Geology

The practical study of the metallic and non-metallic minerals of economic value. Their occurrence and commercial uses. The processes of ore-genesis.

Secondary enrichment. The ore deposits of India. and the more important ore deposits of the world.

Coal—Its origin, distribution, classification and commercial uses. The coal-fields of India.

Petroleum—Its origin and Mode of occurrence. The oil-fields of India and Burma. The principal oil-fields of the world. Natural gas and oil shales.

Geology in its connection with Engineering Problems of water-supply, lines of transport, quarrying, building materials, soils and subsoils Mineral statistics Methods of prospecting. General economic considerations as regards the value of an ore-deposit. The common methods of mining, the dressing of ores, and their metallurgical treatment

PRACTICAL WORK.

The measurement of simple crystals by means of the reflecting goniometer, and the calculation of the crystallographic elements.

The study of the rock-forming minerals in hand specimens and under the microscope Preparation of rock slides, separation of minerals by the electro-magnet and the diffusion column. Separation of sand, mud, and silt by means of the elutriator. Examination of heavy residues from sands

The study of a representative series of rocks and sections in hand specimens and under the microscope. Chemical analysis of a few rocks in the laboratory.

The preparation and interpretation of geological maps and sections. The geological mapping of a selected area in the field

The study of the important genera of the fossil invertebrata.

The recognition in hand specimens and by blow-pipe tests of the metallic and non-metallic minerals of economic importance. Visits to mineralized areas in India and Burma.

A course of field work in topographic surveying. Reduction of results and plotting.

Books recommended - -

1. "Text-book of Geology" Vols. I and II—by A. Geikie (Macmillan.)

2. "Structural and Field Geology"—by J. Geikie (Gurney and Jackson, 1920).
3. "Text-book of Mineralogy"—by Dana Chapman and Eall, 1916.
4. "Hand-book of Rocks"—by Kemp (Van Nostrand Company, 1921.)
5. "The Natural History of Igneous Rocks"—by A. Harker.
6. "Petrology for Students"—by A. Harker, (Cambridge University Press, 1919).
7. "Data of Geo-chemistry"—by F. W. Clark.
8. "Petrographic Methods"—by Weinschenk and Clark (Hill Pub. Company, 1912),
9. "Palæontology"—by Woods (Cambridge University Press) 1919.
10. "Introduction to Palæontology"—by Davies (Thomas Munby) 1920.
11. "Geology of India—by D N. Wadia (MacMillan) 1919.
12. "The Publications of the Geological Survey of India"—on the subjects prescribed in the course.
13. "The Geology of Ore-deposits"—by Thomas and Mac Alister (Edward Arnold) 1920.
14. "Economic Geology"—by H. Ries (John Wiley) 1916
15. "Practical Surveying"—by G. W. Usil (Crosby Lockwood) 1916

Botany.

There will be six papers, as mentioned below and a practical examination. Each of the *first* five papers will carry 100 marks and there will be 200 marks for the Thesis and 300 marks for the practical examination.

Paper I—

Algæ, Fungi and Bryophyta.

Paper II—

Pteridophyta and Gymnosperms.

Paper III—

Angiosperms and Plant Geography.

Paper IV—

Physiology and General Ecology.

Paper V—**Evolution, Variation and Heredity.****Paper VI—**

Thesis, either embodying results of original observations and conclusions based on these or a critical review of the existing literature on a particular branch of the subject.

The following books are suggested:—

STRASBURGER: Text-book of Botany

SCHIMPER: Plant Geography

COULTER AND CHAMBERLAIN: Gymnosperms.

WILLIS: Flowering Plants and Ferns.

LOCK: Heredity, Variation and Evolution

JOST: Lectures on Plant Physiology.

DARWIN AND ACTON: Practical Physiology of Plants.

CAMPBELL: Mosses and Ferns.

WEST: Algæ.

BUTLER: Fungi and Diseases in Plants

SCOTT: Studies in Fossil Botany.

R. C. PUNNET: Mendelion

W. BATESON: Mendel's Principles of Heredity.

DETMAR AND MOORE: Practical Plant Physiology.

F. O. BOWER: Origin of a Land Flora.

G. MASSEE: Text-book of Fungi.

A. B. RENDLE: The Classification of Flowering Plants
Vol. I

F. WORNHAM: Floral Evolution with special reference
to the Sympetalous Dicotyledons.

SOBRERER: Systematic Anatomy of Dicotyledons.

ONSLow: Practical Bio-chemistry.

HAAS AND HILL: Chemistry of the Plant Products.

BOSE: The Physiology of the Ascent of Sap.

THE PHYSIOLOGY: of Photo-Synthesis.

PALLADIN: Physiology of Plants.

SCOTT: Extinct Plants and Problems of Evolution.

BOWER: Filicales Vol. I.

मुद्रक—माधव विष्णु पराङ्कर,
ज्ञानमण्डल ग्रन्थालय, कबीर नौगा, काशी ;
